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The AUTOMOBILE

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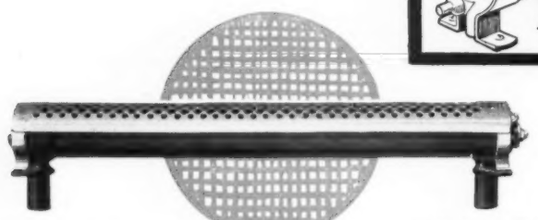

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XXXVII NEW YORK—THURSDAY, DECEMBER 27, 1917—CHICAGO No. 26

Labor-Shortage Hysteria Is Misleading

Frank E. Vanderlip's Talks and Newspaper Articles Are Injurious—Department of Labor Declares Shortage Does Not Exist—Girl in New Position

WASHINGTON, Dec. 26—The hysteria regarding the alleged shortage of labor which Frank E. Vanderlip is so generally creating in his addresses throughout the country in connection with his campaign on War Savings Certificates must be considered perhaps the most serious problem that confronts many industries to-day. Mr. Vanderlip's name is a power throughout the country, and when he temporarily gave up his work as president of the National City Bank, New York, to devote his efforts to war finance on a gratuitous basis, additional importance was added to every statement he might make.

In his addresses Mr. Vanderlip declares that "the government wants to spend a billion dollars a month for the prosecution of the war, and is only able to spend half that amount because labor is not available."

Lack of Thought Apparent

As the only means of securing necessary labor to bring this manufacturing capacity up to government needs, Mr. Vanderlip sees nothing but curtailment of what he describes as non-essentials. Apparently he has not given any thought to the great work of diluting skilled labor and having women replace men. Here is how he expressed himself last week at a meeting in Springfield, Mass.:

"Non-essentials have to go when they come into conflict with war needs. Some of you are in the business of manufacturing articles which are not absolutely necessary, and if the government needs the labor you had better go out of business. The real purpose of this thrift campaign is to teach the people to save and to take the money away from the non-essentials."

This is a surprising statement coming from Mr. Vanderlip, whom we have the highest regard for, but who, unfortunately, appears to be entirely obsessed with thrift by saving rather than by the positive policy of increasing production. His policy seems to be a negative one rather than a positive one.

Shortage Does Not Exist

The Department of Labor does not agree with Mr. Vanderlip regarding the alleged shortage of labor and has figures, which have been obtained from its employment agencies throughout the country, to show that the labor shortage which the daily papers speak of every day does not exist. There are local labor shortages, but not a general labor shortage, and there is no necessity whatever for the present labor hysteria. The department does not agree with Mr. Vanderlip and it is not in sympathy with the misleading propaganda which has gained such wide circulation. The labor shortage situation has been grossly over stated.

The Department of Labor admits that there is a shortage of labor on what might be termed the

fringe of the country, that is, seaport points, but that in the great interior of the land there is surplus of labor. The department's bureau in Kansas City, Mo., reports that it can supply 200 men a day for several months, if it is necessary for other sections to secure such labor. Similar statements could be cited from many other sections of the country, the department says.

Where a shortage of labor does exist the Department of Labor says that it is largely due to the short time given for the adjustment of conditions, and the department believes that with a little added time such adjustments will be satisfactorily made.

The Department of Labor is emphatic in its denunciation of reports which have been circulated through the daily press concerning a labor shortage and says that the cause for such hysteria is due to wrong impressions from individual cases which are magnified into national importance. The Department of Labor cites one example of this: Recently the Civil Service Department issued bulletins calling attention to labor shortage and the need of workers. When the Department of Labor investigated it discovered that there was a call for only 150 people, most of whom had to be highly technical.

Government Figures Available

The department has issued exhaustive figures on the labor situation showing demand and supply throughout the country which bear out the statement that the alleged shortage does not exist. For example, 418,810 people were asked for by employers in a certain period and during that period 413,649 people made application for the position. During that period 283,799 workers were actually placed. During October, 1917, 83,920 people were asked for by employers and 69,031 people applied. There were 51,093 actually placed in employment. September figures show requests for 84,226 people, applications from 57,031 workers, and 46,586 people placed in positions.

Unfortunate Mr. Vanderlip makes no reference to increasing our skilled labor by the dilution process, which has proved so successful in England and France. Instead of starting with dilution he starts with the thought of cutting down what he describes as those industries not connected directly with the war. His words cannot be mistaken when he suggested to such industries in Springfield, Mass., that they had better go out of business if they are not absolutely necessary. Unfortunately this is one more example of talking so-called non-essentials rather than following the more positive policies of improving the efficiency of labor. The article by Christian Girl in this issue on the necessity of increasing production is a forceful answer to Mr. Vanderlip's views.

Christian Girl in New Role

Each week sees developments in connection with the automotive industry in Washington which indicate that there is an ever increasing tendency to select men who are masters in their own departments and who have made good in the work they have had in hand. In this connection the appointment of Christian Girl, president of the Standard Parts Co., Cleveland, to a new position in which he has charge of the Quartermaster's Mechanical Transport Engineering comes after Mr. Girl has made an unqualified success in his position as chairman of the Military Truck Production Board, and which chairmanship he will continue to hold in addition to his new appointment. In his new capacity he will have complete supervision of the completion of the design of trucks and other transport engineering work which comes under the quartermaster's department. It is understood that all problems of design for the mechanical transport work and all engineering problems related to this work will be in charge of Mr. Girl.

In his position as chairman of the Military Truck Production Board, Mr. Girl has had much to do, in fact nearly all to do, with the speedy production of the Class B heavy duty war truck. He has organized a department which has looked into the problem of materials as well as many other kindred problems. Mr. Girl has done valiant service in this work and undoubtedly his new position will be handled with a similar efficient hand.

Ford Investigates Shipping

Henry Ford has broken into the Washington spot light again in connection with the Shipping Board. He has been given permission by Edwin N. Hurly, chairman of the Shipping Board, to make a trip through the South and inspect conditions with regard to transportation, supplies of iron, fuel, and labor with the plan in view of erecting plants through the South in which standardized ships will be manufactured at the rate of six or seven a day, the plan being to use an assembly system very similar to the assembly plants in the automobile industry.

The government will throw all of its money and resources back of this movement if Ford reports that the plan is a desirable one after he has completed his investigations. Mr. Ford starts on this tour of inspection during the present week. While nothing definite is announced, it is expected that these shipbuilding activities will be largely carried on along the shore of the Gulf of Mexico.

Minister of Munitions

Each week sees official Washington doing its utmost to cope with the various industrial war activities in a more business-like manner, a program which is possible in proportion to the different departments getting on a better basis of organization. The feeling is gaining that the work of the army and navy should be largely confined to that of operations in the field and that neither should be burdened with the manufacturing problems connected with the production of necessary apparatus. The English system in this respect is gaining ground each week.

Pressure for the appointment of a minister of munitions is stronger just now than it has ever been before and the Government is giving the matter considerable thought. The English plan is being watched and it may be that such a plan will be operated here. The British ministry of munitions does not include handling of food and clothing but does

deal with purchases of shot, shells, guns and all ordnance and if a minister is appointed here it is probable that he will take over many of the functions now held by the War Industries Board of the Council of National Defense as well as the purchasing functions of the Quartermaster and Ordnance heads of the army, as well as the corresponding officials of the navy.

The large motorcycle manufacturers of the country, called here several weeks ago to design a standardized motorcycle, will soon have this machine design completed and ready to submit to the Quartermaster Corps. This will probably be known as the standardized motorcycle if the design is acceptable to the government.

Howard E. Coffin, using the statement made in this column last week, denounces those who decry the efficiency of the Liberty airplane engine and points to the proof that the Allies have also ordered many of these engines. This government is doing much that deserves investigation and criticism, but it is also accomplishing much that deserves applause, and the Liberty airplane engine and Liberty trucks merit classification in the latter category.

On the whole Washington conditions appear completely favorable to the industry. There are and always will be in all likelihood individuals arising who think the only remedy for the different crises that must occur in wartime is to cut down or cut out something or other, but the majority of Washington officials appear now to be so agreed on a safe and sane handling of the general industrial world that we can assume that these exceptional individuals will not be allowed to proceed far with their theories. They must, however, be prevented from creating business pessimism and thus creating harm to business credit, and they should also be prevented from creating hysteria that will only tend to cut down the efficiency of the nation at this time when every act and effort counts toward our victory in war.

John L. Replogle, expert in charge of steel activities on behalf of the Council of National Defense, it is officially stated, is giving practically all of his time just now to the problem of providing steel mills with coal. The special activities of Mr. Replogle in this connection, as distinguished from the work of Dr. Harry Garfield, fuel administrator, is explained in this way:

Dr. Garfield has authority at the mines, the source, to arrange prices and to fix the output as to quantities, and where it shall go. He has authority to arrange the prices at the point of consumption. He may divert the coal to a given point, so far as instructions as to where it shal go are concerned, but he has no authority to compel the transportation of fuel by the carriers. This authority may be sought through additional legislation at the present session of Congress. Just what the attitude of Congress toward this matter would be is problematical.

Mr. Replogle, in the meantime, is having his troubles in seeking to get the coal diverted for the use of steel mills, sent to the mills. The recent severe cold spell which covered the entire country interfered with such deliveries in a serious way, it is pointed out, but in the last few days the situation has improved and deliveries to steel mills are more satisfactory both as to quantity and promptness in handling.

To Win the War

Industries Must Increase Production

A Positive Policy Is Essential to Success, Says Christian Girl—Manufacturers Must Be Encouraged

WASHINGTON, Dec. 24.—Christian Girl, chairman of the Military Truck Production Board, and incidentally president of the Standard Parts Co., when he gets an opportunity of looking after that organization, has been one of the leading exponents from the automobile industry of the thought that to win the war we must increase production through our industries and not curtail. When the first rumors of a shortage of steel and the possible restriction of shipments of alloy steel to the automobile industry came up Mr. Girl was the leader of the automobile cohorts of the thought that there was not a shortage of steel, and that with steel mills not working at capacity it was literally playing into the Kaiser's hands to curtail production in a great industry such as the automobile industry.

Since the start of the war Mr. Girl has been giving special study to this economic problem, and stands to-day as the acknowledged leader of what might be called this positive policy for industries in war times. Mr. Girl has gone a step farther in his analysis of the economic situation and declares that a revision of our war tax law is necessary in that this tax does not tend to stimulate production but on the contrary handicaps it. He clinches this argument by stating that lowering production in our country will lose the war, or cause unnecessary cost in human lives and money, whereas increased production intelligently directed is the surest path to success.

Putting a Premium on Production

He declares that the excess profit tax law tends to reduce production because it puts a penalty on increasing profits. His suggestion is that both labor and capital require a stimulant and that our tax law should provide such a stimulant. To do this the excess profit tax should be lowered as production increases, whereas the present tendency is to increase the tax as production and profits increase. Mr. Girl would set certain percentage figures on the scale of profits and have the excess profit tax reduced step by step as production increases. This would make it an incentive for the manufacturer to increase production because he would know that on that last million dollars, or hundred thousand dollars, or whatever

other sum it might be, the excess profit tax would be less, and so the manufacturer would be making money by his increased production. In this way the manufacturer would be in a position to go to labor and offer it a premium on increased production, whereas to-day the direct opposite is the case, and there is a handicap placed on production and consequently on efficient labor by the excess profit tax.

Mr. Girl has set forth his views on this subject very clearly in a recent issue of the Cleveland *Plain-Dealer*, from which we quote his views as expressed therein:

In order that more money may be raised by taxes, I SUBMIT:

THAT the present excess profit tax law operates as a depressent to production, whereas a stimulant is required; in that the higher the percentage of profit, the higher the percentage of tax; so that the incentive for larger production and the larger profit that results therefrom is removed.

THAT production is paramount in winning the war.

THAT great production intelligently converted into energy capable of being directed toward the enemy will win the war.

THAT a lowering of production will lose the war, or cause unnecessary cost of war in blood and money, or the things that money stands for.

THAT the army and navy are the acetylene torch that will eat a hole to Berlin.

THAT the products of Ameria are the heat units supplied to the torch.

THAT the greater the production of material things, the more torches available and the hotter the flame.

THAT the first duty of America, therefore, is to produce.

THAT the second duty of America, therefore, is to intelligently apply the torch.

THAT this war is largely industrial and mechanical.

THAT industry and production to-day are largely scientific engineering.

THAT scientific engineering is another name for the efficient use of natural forces.

THAT the war will be won by the most efficient nation unless sheer quantity and bulk overcome the smaller, even though more efficient, nation.

THAT the latter course of action would entail enormous and criminal waste of blood and money; and all because we place a penalty on efficiency; because we fail to return to the richest and most productive soil, that fertilizing stimulant that will keep it most productive; because we fail to feed the cow that gives the most milk, that quantity and quality of provender that would increase the supply and enrich the quality.

THAT the farmer who "skins the soil" bankrupts himself and his children.

THAT that farmer who returns "excess profits" to the soil enriches himself and his children and future generations.

Soil Source of Wealth

THAT all wealth comes from labor applied to the soil.

THAT success lies in the intelligent application of labor to the soil.

THAT a premium, therefore, should be placed upon intelligence.

THAT he or those who endeavor to change the natural law illustrated in the parable of the talents destroys himself as well as his servants and, therefore, jeopardizes his own position.

THAT the difference between the Hindu and the American is represented in the difference in intelligence with which his labor is applied to the soil.

THAT unless we efficiently organize to employ and co-ordinate the great productive forces of America, democracy loses this present war and the world will be unsafe for democracy.

THAT labor is a vital necessity and should be stimulated and encouraged.

THAT equally so the intelligent direction of labor is vital and should be encouraged.

THAT both labor and the intelligent direction of the same should be relieved of penalties and should be placed on a premium basis.

THAT the most efficient should command the highest reward.

THAT increased production can be secured by several methods:

1—By longer hours to which there are physical limitations.

2—Greater speed, to which there are also physical limitations.

3—Utilization of the aged, the young and females, to which there are also limitations, and should be done only as a last extreme.

4—The three methods named above are as yet entirely unnecessary, and will be unnecessary until we shall have utilized to the limit those methods of efficiency and the forces of nature are properly harnessed and controlled in the interests of the greatest production. To this last method there is no known limit, but this result can only be accomplished by putting a premium on efficient production and a penalty on idleness and inefficiency.

We have our choice—be prosperous and win the war, or hide our talents, slow down production, diminish our effective force and lose the war. America has the chance to show the German nation that a free people can win a war and be more prosperous at the end than at the beginning, whereas a slave nation will go down to defeat and poverty; and this will do more to bring lasting peace than any other lesson we can teach the German nation.

In the interest of all the above I submit for consideration a change in the excess profit tax plan, substituting the following for the percentages mentioned under rate of tax:

To illustrate:

Thirty-five per cent on difference between 9 per cent and 15 per cent. A less per cent on difference between 15 per cent and 20 per cent. A less per cent on difference between 20 per cent and 25 per cent. A less per cent on difference between 25 per cent and 33 per cent. A less per cent on difference between 33 per cent and 40 per cent. A less per cent on difference between 40 per cent and 50 per cent.

The percentages mentioned above should be arranged for by statisticians and are illustrative as estimates only.

The present plan is equivalent to standing a pyramid on its apex rather than on its base. The above decreasing rate of tax in proportion to increase in profits need be very slight and very close to a straight line. In fact, a straight line or constant rate of tax in proportion to the rate of profits would be much better than the present plan, which puts a penalty on increasing profits.

We suggest further that a tax of 80 per cent be placed on profits above 50 per cent on capitalization, unless these profits are invested in government securities, in which case no tax should be levied.

In the above plan due allowance for percentage of profit on turnover of sales in relation to the capital invested should be considered. For instance, the rate of tax should be the same in all industries engaged in the same kind of business, but a different rate might be allowed to an industry making only 12½ per cent profit on its turnover, as against another industry making 12½ per cent on its turnover, in which latter case the turnover would be twice a year as against once a year in the first instance.

We suggest as a further modification of the excess profit tax plan, and in order to secure the rapid exchange of money, that 40 per cent of all profits above government taxes be distributed to the stockholders of corporations in the shape of cash dividends or government securities, and that a definite percentage of profits above government taxes be distributed to employees. The government should collect 10 per cent of the amount of money so distributed to stockholders and employees as taxes on special income from corporations.

I submit:

THAT the above will raise more money than the present plan.

THAT the above will make this country prosperous.

THAT the above will consolidate labor and capital; the whole idea being that the higher the production and the higher the profits and greater the efficiency, the greater the distribution of profits and the lower the rate of tax but the greater the total amount of money raised.

War Influence in Industries

1917 in Review

1—Factories Converted to War Needs

2—Car and Truck Exports Increase

3—Patent Litigation at Low Ebb

4—Few Important Mergers in Year

RESTRICTION, creation and conversion best express the dominant movements in the automotive industries during 1916, all three being results of the war.

The manufacture of passenger automobiles has been automatically restricted, the falling off of demand in the cities, and in some sections of the country, causing this.

The year has witnessed the creation of the aviation industry, the $640,000,000 appropriation being one of the great stimulants in this creative process.

Nearly all of the automobile makers have converted their factories so that instead of manufacturing solely automobiles, they are producing trucks, some of them farm tractors, many of them airplane parts, and others parts for ordnance and other departments of the service.

The motorcycle industry has, thanks to government requirements, standardized as it had no thought heretofore of standardizing, and the product of some of the largest makers has been largely converted to government uses. Only the first chapter in this conversion work has been written. The second and subsequent chapters are already in process.

Standardizing the Industries

The motorboat industry has been converted entirely to one of government requirements, and the production of standardized boats marks a step that might have been years in arriving under peace conditions.

The extent to which restriction, creation and conversion have been carried can scarcely be grasped at this time, although the 9 months of war have brought about unexpected changes, and these have been immeasurably more rapid than they would have been under peace conditions.

The leading automobile manufacturers are no longer manufacturers of passenger automobiles solely, but of many lines. Of the first eleven makers of automobiles, that is, those being the largest producers, all are manufacturing, in addition to automobiles, motor trucks, many are making airplane parts and several are manufacturing farm tractors.

The Ford company, which set a new production record of 3000 cars in one day, a few weeks ago, has gone into production on the Ford tractor, which is being shipped in quantities to England and France. The Ford truck has been brought out during the year and is in production. The company is one of the largest manufacturers of airplane parts and has a contract for Liberty engines. It is reported that Ford has secured approximately $300,000,000 worth of government contracts. The latest possible Ford development is that of the probable manufacture of standardized ships.

How Industries Are Converted

The Willys-Overland Co., which during the last fiscal year ending June 30 was the next largest producer to Ford, has carried out a comprehensive conversion program. The Curtiss Airplane Co. has been secured and is now a part of the Willys organization. In addition the company is manufacturing the Sunbeam aviation engine. It is also a manufacturer of commercial vehicles.

Buick, which has been next to Overland in production, has, through its being a part of the General Motors organization, allied itself with the tractor interests through the Samson farm tractor brought out during the year. The company is connected in the truck industry through the G. M. C. line. It has recently taken a contract for Liberty engines so that its manufacturing activities have broadened.

During the year Dodge has gone into production in the manufacture of a commercial vehicle, and its conversion is being carried still further by the addition of a large factory which will be devoted entirely to government work in the manufacture of recoil devices for guns.

Cadillac has taken on the manufacture of Liberty engines. Packard, in addition to its car and truck program, is the first concern to be in production on Liberty engines. Reo has taken contracts for tractor manufacture. Marmon has erected a new factory for the manufacture of aviation engines. Mitchell and Premier have taken large contracts for the manufacture of F. W. D. war trucks. Nash has built up a complete line of motor trucks in addition to getting on a production basis for passenger automobiles. Grant has added a truck line. Stearns is

manufacturing parts for the Rolls-Royce aviation engine. Briscoe has been working on ordnance contracts. Chalmers has contracts for gun parts. Franklin has aviation engine work.

Looking at the other side of the industry which manufactures parts and accessories, the work of converting the manufacturing program over to meet aviation needs, ordnance needs, motor truck needs, etc., can be seen on every hand. Nearly all of the engine concerns are working on contracts for the standardized war truck engines or tractor engines for European governments. Continental and Wisconsin are leaders in this work. Buda has ceased the manufacture of passenger car engines and is working on truck and tractor types only.

The ball bearing manufacturers have with very little if any change converted their activities to the requirements of aviation, war trucks, and other government needs.

Radiator manufacturers have not had difficulty in manufacturing radiators for airplanes, as well as the new trucks.

Carbureter makers have been busy redesigning to meet the needs of farm tractors, war trucks and aviation engines.

Makers of ignition parts have stepped into the breach and met all the requirements by designing special apparatus for aviation engines.

So it is throughout the entire gamut of manufacture of parts. There has been a commendable conversion and adaptation to the new needs. It has not been necessary to organize new concerns to produce the special apparatus occasioned by the war. For example, our manufacturers of ignition apparatus have met every need. This also applies to such manufactures as tires, carbureters, radiators, etc. Speedometer makers are manufacturing special instruments for airplanes. Manufacturers of stampings have investigated the tractor field and the airplane field, and have designed new parts to meet requirements. Makers of tubing have investigated the possibilities in the aviation and farm tractor fields.

The year has been one of a broader vision on the part of all manufacturers and has witnessed a knitting together of the automotive industries into one larger industry.

In this connection it is appropriate that the largest body manufacturer, the Fisher organization of Detroit, should be the greatest manufacturer of planes for the airplanes.

It is fortunate that existing companies have been able to rapidly lend themselves to the new problems rather than having to face the problem of organizing new companies to carry out the government work.

As practically all automobile and automobile parts concerns have been operating on production methods for several years, they were able to meet the government requirements with a promptness and efficiency which would not have been possible had the great problems of production not been previously mastered.

There have been a few companies added to take care of the requirements. In the aviation field, the Lincoln Motors, formed by the Lelands, is a new organization that will manufacture Liberty engines. The same applies to the Trego Corp., which is manufacturing these engines. With possibly these two exceptions the production of engines for aviation purposes will be carried on in existing factories.

Exports Increase Despite Ship Shortage

Foreign Buyers Take More Cars and Trucks Than Ever—Canada a Chief Market

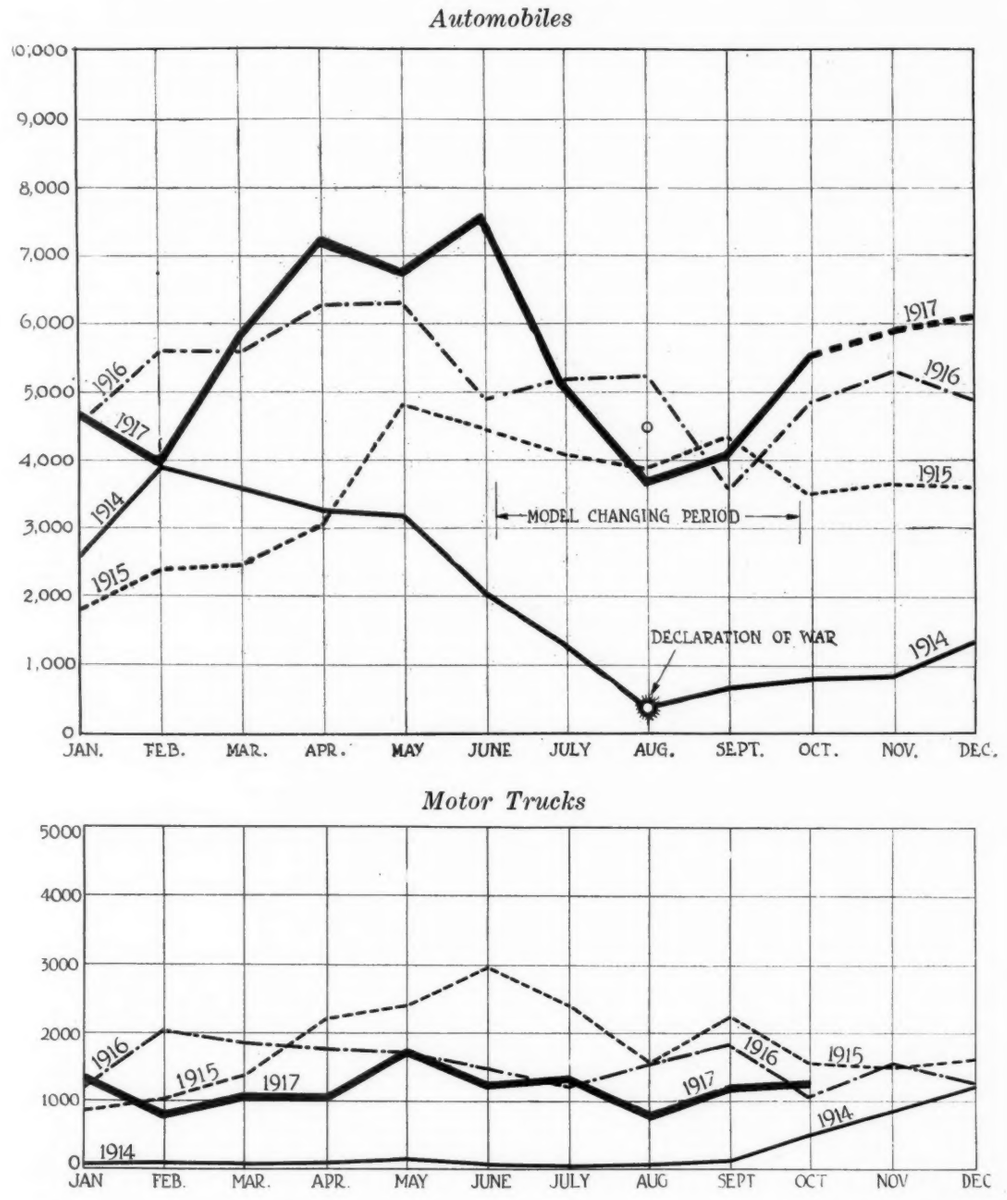
EXPORT figures giving the number of automobiles and trucks shipped abroad during the year cannot be accepted as a criterion of the demand in other countries for American goods, nor can these figures be accepted as indicating the ability of American manufacturers to furnish these goods. The submarine warfare and the ship-building program have such a direct influence on this work as to constitute the neck of the bottle, and the number of automobiles or trucks exported to Australia, to South America, to British South Africa, or to New Zealand have been dependent on the amount of shipping facilities at hand.

This is not offered by way of apology for a slight reduction in the total number of motor vehicles exported during the first 10 months of 1917 as compared with the first 10 months of 1916, but you can only interpret export figures in conjunction with shipping facilities.

The number of passenger automobiles exported in the 10 months of 1917 is 2319 greater than the number exported in the first 10 months of 1916. In 1916, during the first 10 months there were 52,109 passenger cars exported. In the first 10 months of 1917 there were 54,428 automobiles exported. This is a condition on which American manufacturers should congratulate themselves.

Had the exports of motor trucks held up as well as that of passenger cars the totals for the 10 months would be well in excess of last year, but unfortunately during the first 10 months of this year there were 3900 fewer motor trucks exported than in the same 10 months of a year ago. This is due to a falling off in demand from the Allies. In other words, the Allies had their greatest demand for motor trucks during 1915. June, 1915, was the biggest export month for motor trucks in our history. During that month 2990 trucks were exported. The

The Curve of Car and Truck Exports for 4 Years



wave of war demands reached its crest in June, 1915, and since then has been gradually falling, although it has been fairly constant during the 10 months of this year, with the possible exception of February, where the exports fell to 784, a lower figure than at any time during the previous 26 months. This was directly due to the beginning of the unrestricted submarine campaign which started Feb. 1. The effect of the submarine campaign on passenger car shipments during February was also apparent when the exports dropped to 3939 machines, which was a figure approximately 2000 below the normal monthly exports at that season.

In the purchase of passenger cars during the past 10 months, Canada has been the leader, taking more than twice as many as any other country. The exports to Canada average about 1000 cars per month. Australia has been a good market, averaging about 260 cars per month. During August there were only eleven cars shipped to Australia, which was due to restricted shipping facilities as well as that being the inventory period in the factories.

The export curve of passenger automobiles in trucks covering the past 4 years indicates that there is a general falling off during July and August, which are holiday months. These are also the inventory periods. It may be that the annual model program of our factories has to some extent been responsible for the poor export showing in July and August.

Argentina has been a good purchaser, averaging

Exports of Passenger Cars from U. S. A.

Figures are numbers per month

	1914	1915	1916	1917
JANUARY	2481	1803	4520	4733
FEBRUARY	3837	2230	5651	3939
MARCH	3538	2429	5539	5755
APRIL	3239	3078	6242	7276
MAY	3157	4921	6275	6725
JUNE	1982	4418	4905	7609
JULY	1265	4118	5258	5081
AUGUST	385	3839	5254	3697
SEPTEMBER	646	4299	3585	4077
OCTOBER	732	3479	4880	5536
NOVEMBER	776	3690	5337	....
DECEMBER	1297	3664	4911	....
	23,335	41,968	62,357	54,428

Exports of Motor Trucks from U. S. A.

Figures given are numbers per month

	1914	1915	1916	1917
JANUARY	45	935	1269	1340
FEBRUARY	57	1002	2063	784
MARCH	50	1339	1878	1040
APRIL	52	2267	1790	1039
MAY	141	2426	1717	1764
JUNE	90	2990	1416	1245
JULY	50	2468	1243	1386
AUGUST	66	1614	1565	838
SEPTEMBER	128	2227	1835	1251
OCTOBER	672	1596	1144	1333
NOVEMBER	842	1553	1655	....
DECEMBER	1279	1664	1331	....
	4472	22,081	18,906	12,020

almost 400 cars per month. Although transportation has been somewhat limited the exports to Chili have shown a remarkable increase, that country taking as high as 479 cars in October. In short the export trade with South America has doubled during the year. New Zealand has been a steady market. British South Africa is a rapidly developing market, as shown by the figures, that country taking upwards of 275 cars per month. The Cuban trade has been very satisfactory, running to 401 machines in August, 327 in September and 344 in October. The Cuban average for the year should be a high-water mark for that country.

Of the European countries, Great Britain has been the largest consumer, notwithstanding her restrictions on the use of automobiles. France has been nearly as heavy a buyer. There has been no trade with Denmark during the past 4 months, but in June 40 machines were exported. The trade with Norway has been dropping off and during October no cars were exported. The trade with British India has fallen very badly.

The tabulation showing the number of trucks exported each month during the past 4 years as well as the number of passengers exported monthly during the same period is worthy of study.

Standardization Reaches Other Fields

Co-operation With Government Brings Many Additional Activities

DURING the past year the work of the S. A. E. Standards Committee has greatly expanded, as a direct result of the increase in scope of the Society's activities. It was during the latter part of the previous year that the Society decided to take under its wing the allied industries of aircraft, marine motor craft, tractors, motorcycles and stationary and farm engines, and in the course of the past year divisions of the Standards Committee representing these different industries were appointed.

While the number of new standards finally approved by letter ballot and placed upon the record

New Standards Adopted During 1917

Extension of adjustable yoke rod ends.
Extension of plain yoke rod ends.
Extension of eye rod ends.
Revision of rod end pins.
Spark plug shell for aircraft engines.
Carrying capacities and inflation pressures of pneumatic tires.
Pitch and widths of silent chains.
Thrust ball bearings, five series.
Poppet valves.
Complete car performance test specifications.
Flange mountings for generators.
Flange mountings for starting motors.
Revision of head lamp detail specifications.
Headlamp nomenclature.
Aircraft wheel control.
Aircraft stick control.
Loops and ferrules for round steel tinned wire.
Loops for non-flexible single strand steel cable.
Loops for flexible multiple strand steel cable.
Galvanized steel thimbles.
Plain hexagon head bolts.
Ball hexagon head bolts.
Castellated hexagon nuts.
Ball hexagon nuts.
Marking of aircraft pipe lines.
Supports for aircraft engines.
System of measurements.
Gaging of sheeting metal, rods, tubes, wires and cables.
Tractor drawbar rating.
Tractor belt power rating.
Tractor belt speed.
Height of tractor drawbar.
Plowing speed.
Magneto dimensions for tractors.

books of the Society is large, the amount of work done by the different committees, and which will be placed before the Standards Committee as a whole at the coming January meeting, is enormous. New divisions appointed during the year include the motorcycle, tractor, roller chain, stationary and farm engines, data sheet and fuel and lubricant divisions.

A new turn was given to the work of the committee by the outbreak of the war. Owing to the great need for automotive apparatus in carrying on the war and the help that standardization will give to rapid production, the Government has been co-operating with the S. A. E. in various lines of work. Aeronautic standardization really began before the outbreak of the war, but has been greatly accelerated since that time. Quite a number of the men on the aeronautic division of the Standards Committee are now located at Washington and most of the division meetings have been held there. It was also at the request of the Government that the motorcycle division was formed. This division has been a most active one since its organization, having held meetings in Atlantic City, Chicago and Milwaukee, and having standardized a great many items in motorcycle construction.

Adapting Existing Standards

One of the lines of work taken up by the divisions representing the different industries is to go over existing S. A. E. standards, which were adopted for automobile practice, and select those which can be used without change in their own line of engineering. Thus the marine division and the aeronautic division have compiled lists of old S. A. E. standards adapted for their work, and the motorcycle, tractor and stationary and farm engine divisions will shortly do the same thing.

A very busy session is ahead of the Standards Committee when it meets in this city next month. One of the topics to be considered is that of turnbuckles, shackles, clips and clevice pins for aircraft. Standards for these parts were adopted by the committee at Washington last June, but it was found that these were different from standards adopted by the International Aircraft Standardization Board and an attempt will be made to harmonize the two sets of standards. There will also be reports on clamps and fittings for cooling system, rubber hose, on dope, spar varnish and glue for aircraft, on instructions for testing airplane engines, on forms for specifying aircraft engine weight and for recording engine test results. Another subject that will be reviewed at the suggestion of the International Aircraft Standardization Board is that of ferrules for solid wires. The Board recommends eight coils of tinned steel wire instead of the ten now specified.

Aircraft Division Recommendations

The report of the aircraft division will also recommend an extension of the lists of plain and hexagon head bolts, castle hexagon and ball nuts for aircraft, and a new table for plain hexagon nuts is to be added. All of these bolts and nuts are for use in body and wing construction and not for engine work. Other items to be covered in the report of this division include the metric spark plug shell, airplane steel wire and cable of different grades, reels for winding aircraft cable, tachometer connections, a series of round and square washers and rubber hose for gasoline.

Considerable new work is coming through in the marine division. The items to be reported on include engine couplings, reversing gear couplings, bronze shaft couplings, propeller hubs, propeller shaft ends and fairwaters. The recommendations

Exports of Motor Vehicles, Passenger Cars and Trucks, by Countries, from the United States in First 10 Months of 1917

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Denmark	90	15	46	86	24	6	..	..	..	..
France	465	503	151	248	530	392	431	191	251	591
Germany	..	..	..	..	..	..	..	..	..	..
Italy	10	4	..	1	172	26	..	..	..	..
Norway	..	..	..	..	..	..	37	32	16	..
Russia (in Europe)	175	65	67	2	69	90	22	86	328	157
United Kingdom	801	280	685	462	1,242	1,076	952	535	750	722
Other Europe	344	160	367	203	573	231	..	..	..	..
Canada	875	673	1,809	2,937	2,450	2,032	1,432	967	657	1,100
Mexico	96	313	308	360	523	1,005	..	..	..	..
West Indies, inc. Cuba	374	368	271	247	320	554	189	401	327	344
Argentina	227	242	270	369	405	212	350	145	331	875
Brazil	84	68	136	65	135	130	..	..	..	..
Chile	238	201	257	264	152	528	431	261	294	479
Venezuela	44	73	84	13	16	27	..	..	..	..
Other South America	201	198	278	242	428	230	..	..	..	..
East Indies	614	358	402	330	261	86	64	295	101	93
India	..	..	..	..	..	..	14	..	8	..
Russia (in Asia)	..	..	..	..	..	..	4	..	1	..
Philippines	..	..	..	..	..	..	30	121	119	50
Other Asia & Oceania	887	638	870	762	708	1,127	..	..	..	..
Australia	291	172	447	507	339	826	167	11	242	528
New Zealand	..	..	..	..	..	..	143	28	228	215
British South Africa	..	..	..	..	..	..	301	335	168	248
Other Countries	257	392	347	1,217	142	276	1,904	1,123	1,507	1,467

to be made in connection with these subjects will be in the form of tables with dimension drawings.

Four subjects will be reported upon by the miscellaneous division, viz., an extension of the yoke and eye rod end series, bumper height and dimensions, speedometer head mounting on the instrument board and a series of fine S. A. E. threads from ¼ in. to 1½ in. inclusive.

Reference has already been made to the activities of the motorcycle division. This division will report to the Standards Committee regarding brake pedal, clutch pedal, stop, starter and gear lever motions, a standard roller chain for motorcycle drives, cylinder displacement, fuel and lubrication pipe fittings, size of thread on oil and grease cups, mounting lugs on headlamps, prongs for supporting headlamps, rims, spokes, nipples, spoke steel wire, tests for same, method of lacing motorcycle wheels and tire sizes.

The lighting division has reviewed and revised its specifications concerning headlamp illumination and has standardized the focal length of electric incandescent lamps for both gasoline and electric vehicles.

A series of medium duty roller chains will be reported on by the roller chain division. This series includes sizes from ½ to 1½ in. pitch and the work of standardization covers the pitch, width and roller diameter. The table of sizes is also to include trade numbers for the different sizes. Some work has also been done by this division on the nomenclature of the component parts of roller chains and this, too, will be submitted for approval to the committee.

The tractor division will report on only a few items, these including fuel and lubrication pipe fittings, magneto mountings, drawbar design and condensed tractor specifications .

Early in the year a plan was formulated with a view to completely revising the S. A. E. data sheets, and a data sheet division of the Standards Committee was appointed. A new system of indexing the sheets has been evolved, but owing to the intensive use of the sheets by various Government departments at the present time and for other reasons it was decided to retain the present indexing system for the time being. A very much more complete index has been compiled and recently issued to the membership. This will facilitate the use of the data sheets.

Patent Activities Sluggish During 1917

NINETEEN hundred and seventeen has not been an active year in the patent field, and there has not been the adjudicating of important patents such as a year ago. There are several important patents which are still in the courts, and going through the usual dragging process.

The Linday patent on rear axle construction, involving that design in which the driveshafts of the axle can be withdrawn and the differential removed, was declared invalid in the Winton suit. The patent in question is No. 748,760. The court held that the principle of building the axle so that the differential could be easily inspected and the axle shaft readily withdrawn was not new, and that the method used was only such as to call for skill expected in the trained mechanic.

What is known as the Huber three-point engine support patent was adjudicated in the case of the North American Vehicle Co. against the Detroit Taxicab Co. The patent was held valid but its scope is so narrow as not to interfere with three-point suspension as used by manufacturers.

A patent case which is still in the courts and in a rather highly confused state is the Reo valve action. This case started by a suit against a Reo dealer in Utica in which the decision was against Reo. A suit was filed against a New York City dealer and a decision in favor of Reo given. The case is now up in the Michigan courts and it may be some time before a decision will be granted.

Another case which is in the courts is that of the Gear-Grinding Machine Co. vs. Studebaker Corp. The patent is one relating to the grinding of splined shafts and embraces not only the method employed but the machine used.

An important patent situation of the year was the upsetting of what is known as the Perlman patent by the Firestone company, and the discrediting of Perlman in connection with certain evidence in the case.

The pooling of patents has continued during the year and the agreement of pooling the airplane patents which greatly clarified the atmosphere in connection with aviation manufacture was directly traceable to the precedent set by the automobile manufacturers.

In the pooling of airplane patents the members of the association known as the Manufacturers' Aircraft Association, Inc., agreed to the taking over of various patents owned by the individual members and so cross-licensed that their use may be made universal to all engaged in the industry. The airplane field was diveded into two hostile camps by litigation, one camp being the Wright-Curtiss organization controlling the Wright patents on manipulation, and the other camp being the Curtiss Aeroplane & Motor Corp., controlling patents on hydroplanes.

The Kardo front axle patent was declared valid, this patent referring to the construction of the spindle on the front axle. The patent refers to mounting of two rows of ball bearings on the spindle and placing the larger row of bearings at the inner end and directly in radial line with the spokes. The patent is No. 753,820 and was granted March 1, 1904, to Walter Baker.

In the farm tractor field the most important patent matter is that of Henry Ford giving to the British government the patent rights on his tractor and permitting that government to manufacture them in large quantities.

International Screw Threads

London Conference January, 1918, Aims at Anglo-American Standardization—Under Government Instigation

A MOVEMENT has been started to secure interchangeability between the screws used in the United States and those used in England—in other words to agree upon an international British-American screw thread system. The following memorandum was drawn up in the hope that it might facilitate the deliberations at the forthcoming Anglo-American conference on screw threads, to be held at London in January. It was approved at a meeting of the Sub-Committee on Screw Threads of the British Engineering Standards Committee, and was cabled to this country by Secretary Le Maistre of that committee.

Classification of Threads

Threaded work may be divided as follows:

Class 1—Threads on constructional bolts, nuts and studs.

Class 2—Threads of relatively large diameter and fine pitch, such as pipe threads and those on the screwed parts of shells or on shafts and axles.

Class 1 work of British Engineering Standards Committee up to last year has been mainly devoted to threads coming under this class and has been based upon long established standards of Whitworth. Two reports, Nos. 20 and 38, have been issued on the subject. Report No. 20 gives two ranges of pitches, coarse and fine, for constructional screws. The coarse range is identical with the original Whitworth standard and is known as the British Standard Whitworth. The fine range, called the British Standard Fine, utilizes Whitworth chasers. So far as the committee is aware the United States standard thread differs from the Whitworth in the form of the thread, and in the case of the ½-in. screw it differs in pitch, having 13 threads per inch, while the Whitworth has twelve. Nevertheless in common practice it is found that there is some degree of interchangeability among screws made to these different standards.

British Standard Fine pitch screws have been largely adopted by the British automobile industry but are of rather coarser pitch than those adopted by the Society of Automotive Engineers and are not interchangeable therewith. A table showing the standard pitches of constructional screws up to 1½-in. diameter used in Great Britain and the United States at the present time will follow for constructional screws of small size and fine pitch. Great Britain has in use a series known as British Association screws. These were based upon the Swiss Thury system and are almost universally employed for instrument and similar work. Standards have been established in the United States for similar purposes, but there is no agreement between the standards of the two countries.

Agreement in 1913

Practical international agreement on the pitches of the threads to be cut on steel and wrought iron pipes was reached at the international congress on pipe threads held in Paris in November, 1913, at which Great Britain, the United States of America, France, Switzerland and Germany were represented, but the war has delayed the definite adoption of this proposal.

The Whitworth angle is 55 deg., with threads rounded equally at crests and roots to a depth of one-sixth part of that of the sharp Vee. The American thread has an angle of 60 deg. and the angle of the top and bottom is truncated to a depth of one-eighth part of the depth of the sharp Vee. It seems desirable to consider therefore whether it would be possible to take any steps toward the establishment of an Anglo-American standard of form together with a series of pitches for bolts and nuts.

Report No. 38 of the British Engineering Standards Committee revised in February, 1913, aimed at improving the fit of screws and securing interchangeability by prescribing limits of error tolerances for the threads of bolts and nuts. Experience since has shown that these tolerances are in some cases too fine and will need revision. It appears moreover that it is desirable to have close limits on the effective diameter and pitch of a screw in order to insure interchangeability in combination with good fit, but that in many cases the exact form at the crests and roots is of minor importance so that the wider limits on the dimensions controlling those parts are permissible, provided these limits be so chosen as to insure that the bolts and nut will go together. Agreement on these points is very desirable.

It is clear that if that number of elements on which exact workmanship is required is reduced it becomes possible to require a higher standard on those which remain Class 2. The importance of the second class of threaded work, especially shell and fuse work, has greatly increased since the beginning of the war, owing to the enormous output of munitions, and much valuable experience has been acquired bearing on the subjects of design, manufacture and gaging. When this class of threaded work had to be produced, interchangeability in workshops all over the United Kingdom and in the United States immediately after the war broke out, the inspectors required gages to enable them to pass or reject the work, and at first great difficulty was found in turning out these gages with a sufficient degree of accuracy. This accuracy has, of course, to be very considerably greater than that required on the threaded work itself. Much has been done in Great Britain to produce these gages in quantity and with sufficient accuracy.

Dependence on Tools

For this class of screw taps and dies it is becoming increasingly evident that accuracy and interchangeability on bolt and nut work depend very largely on the tools used, notably on the taps, and that a chief cause of bad fit on bolt and nut work would appear to be pitch error in the tools employed. It was noticed as far back as 1903 that the alteration in the form and pitch of the taps and dies through distortion in the hardening method then in use often was as great as three-thousandths of an inch per inch, and this necessitated an allowance on diameter of double this amount, which in the case of very small threads forms a large fraction of the total engaged thread depth.

It is hoped that the British Engineering Standards Committee will shortly be in a position to issue a specification of limiting dimensions for taps and gages to meet as far as possible the requirements of British industries. The British Engineering Standards Committee has undertaken an experimental inquiry into the distribution of stresses in bolts and nuts, which is being carried out by Mr. Rowland of Leicester. The inquiry is based on Professor Coker's well-known method of illuminating stressed transparent celluloid models by polarized light. Experiments have already been carried out which reveal the nature of the stress distribution in Whitworth and in Sellers threads, and also in a combination consisting of Sellers belt and Whitworth nut. It is hoped to develop this mode of investigation and to obtain exact measurements of the stresses, especially near the roots of the threads, where they are most severe, in order to compare the effects of different forms of thread.

Europe's Aviation Truck Design

Disk Wheels a Necessity—Governors Not Desirable — Divisions of Trailers—One Tire Size

By W. F. Bradley
Special Correspondent for AUTOMOTIVE INDUSTRIES *in France*

PARIS, Nov. 1—Although America has supplied thousands of automobiles of various types to the different Allied armies, some of the special machines required in the aviation service have remained almost unknown on the western side of the Atlantic. Flying squadrons in the field need three types of automobiles: a truck of 3 or 3½ tons load capacity, only differing in a few of its details from the Standard Quartermaster's truck; a fast pneumatic tired 1½-ton truck, and cars for officers.

The specifications recently issued by Washington on the 1½-ton aviation truck show that advantage has been taken of European experience, for the type asked for corresponds to that in use in France. A truck with a load capacity of 1½ tons fitted with pneumatic tires, capable of maintaining a road speed of 30 m.p.h. and designed to operate on very frequent occasions with a trailer, is quite foreign to American peace conditions. Even in Europe the type was little used before the war, but it has now been developed to such an extent that in the French army the 1½-ton type is employed exclusively with the squadrons, the heavier 3½-ton truck being found only with the parks back of the squadrons.

Necessity for Governor Doubtful

So far as the motor is concerned no serious criticism need be brought against the American specifications. It is doubtful, however, if a governor is really needed on a truck of this type. These vehicles more often operate singly than in convoys and frequently have to be driven to the limit, the general conditions of operation more closely approximating those of staff cars than of the regulation trucks. The only useful rôle of the governor, therefore, would be to prevent the drivers from racing their motors on down grades.

Worm gear rear axles have not been extensively employed for this class of vehicle in Europe, the great majority having straight bevel. No objection need be brought against the worm gear axle so long as sufficient clearance is provided, for all aviation vehicles are called upon at frequent occasions to operate more or less across country. The final gear ratio of 7¾ to 1 is much lower than generally found necessary in Europe. The lowest here is 6 to 1; many vehicles have 5¼ to 1, which is satisfactory.

It should be remembered that aviation camps are placed a certain distance back of the lines, where good roads are available and where a high average speed can be maintained. Although it is necessary at times to work away from made roads, conditions are such in France that aviation tractors do about 90 per cent of their work on made roads, over which they can run at high speed.

Wooden Wheel Condemned

The provision of artillery wheels and different size tires for front and rear wheels is open to very serious criticism. All European war experience has been against the wood wheel, which is weaker than all-metal types, deteriorates rapidly, and is easily damaged by fire and shell. For fast tractor work the demountable steel disk wheel has proved itself ideal under the most trying conditions.

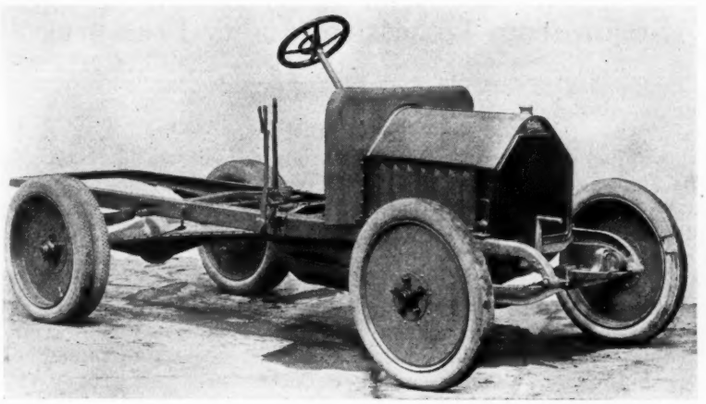
The fitting of two sizes of tires is an elementary mistake it should not have been possible to make at this date. Great efforts have been made by the various European armies to reduce tire sizes to the smallest possible number, and nowhere is it permissible to have two sizes on the same vehicle. Even the modest Ford only goes into service after the front tires have been changed to correspond with those on the rear wheels. The ideal equipment for a 1½-ton aviation tractor is 34 x 4½, singles on the front, duals on the rear wheels. These are quite adequate for the load to be carried. One precaution to be observed is that the duals should be placed as close as possible so as to prevent stones finding a lodging place between the two tires and thus damaging the walls of both. With duals the tendency to skid is enormously reduced; it is also possible to work in

This is the type of special airplane motor car most extensively used in Europe. It has steel disk wheels and dual tires and is built by the Fiat company

snow with a much greater degree of safety than when single tires are made use of.

Two spare wheels, without any spare tubes, are all that is required, for it is always possible in a case of emergency to run without load with one of the duals punctured.

Another advantage of this combination is that 34 x 4½-in. tires are quite suitable for the trailers employed in very large numbers by the airplane squadrons. With interchangeable tires and wheels there is not only an initial economy but a great saving in operation. Tires which are not considered safe for the tractor can be put on the trailer. Further, 34 x 4½ is a tire size which could be adopted with great advantage for the officers' cars employed by the service. Thus, with the exception of a few of the very powerful and fast staff cars the entire aviation service could be equipped with a single size of pneumatic tire. In drawing up the specifications the value of standardization from both a manufacturing and the users' standpoint appears to have been completely lost to view.



This is the chassis of the special airplane motor car illustrated on the opposite page. The picture gives some idea of the rugged construction

In addition to the ordinary tow hooks at the four corners of the frame, every aviation tractor should be equipped with a central spring-mounted tow hook at the rear attached to a specially strengthened cross-frame member. This may have been provided for on the American tractor, but it does not appear in the published specifications. It is found that this type of tractor is most suitable with fixed sides, a swinging tail board, and bows receiving a canvas top, thus making it possible to use it as an open truck or as a fully closed vehicle. Its greatest use is closed, but occasions arise when the tractor has to be employed without the bows and the canvas top.

Types of Aviation Service Trailers

A greater variety and a greater number of trailers are required in the aviation service than in any other branch. The most common types are:

1—Two-wheel trailer, load capacity 2500 lb., dimensions about 14 ft. by 6 ft. 5 in., with wood sides and canvas top, making it a completely closed vehicle, fitted with dual pneumatic tires 34 by 4½.

2—Two-wheel platform trailer, platform type, overall length about 23 ft. Pneumatic tires 34 by 4½.

3—Two-wheel platform trailer, with bows and canvas top, overall length about 30 ft., with special internal fittings to receive wings. Pneumatic tires 34 x 4½ in.

4—Two-ton, two-wheel trailer, some with demountable sides and some with canvas top, fitted with solid rubber tires.

5—Three-ton, two-wheel trailer, with demountable sides and solid rubber tires.

6—Big four-wheel platform trailer on solid rubber tires, platform length not less than 30 ft.

In addition to the above there are required gasoline tank trailers; kitchen trailers; workshop trailers fitted with hand tools, work bench with vises and a portable breast drill; also various photographic and telephone trailers.

The trailers coming under headings 1, 2 and 3 are the types required in greatest numbers and are always used behind the fast 1½-ton tractors. Trailer No. 1 carries general supplies, such as propeller, landing gear, turnbuckles, wire, instruments, etc., and really acts as a first-aid vehicle to airplanes on active service. Hitched behind one of the fast tractors it can be rushed out to any place where a machine happens to be down, so as to give immediate assistance.

Traveling Automobile Workshop

Repair work in the automobile service is entirely different from that in the general automobile service. The most successful plan appears to be to attach to each squadron in the field a traveling automobile workshop fitted with power-driven lathes, drill press, emery wheel, band saw and having a forge, acetylene welding equipment, benches with vises and a complete equipment of hand tools for both wood and metal working. Such a shop is generally accompanied by a trailer carrying a supplementary collection of tools. The most satisfactory method of working is for the workshop to be ready at all times to go out to the assistance of any machine brought down back of the lines and make repairs on the spot.

Where the most efficient system prevails a competent officer visits every reported accident and decides whether or not the machine can be repaired on the spot so as to allow the pilot to fly home. If it is only a case of such trouble as a broken valve, broken oil lead, choked gasoline lead, broken wing or tips, the repair should be made on the spot.

Another advantage of retaining the mobility of the workshop is that when the squadron is ordered to change its quarters the mechanics can move up immediately. When the workshop is allowed to become a fixed establishment so much material is gathered together that it often requires a day to pack and move. There is a tendency among mechanics to demand a fixed workshop, but if the airplane workshop is properly designed and fitted out in the first place, there is no reason why it should ever lose its mobility.

Light Diesel Engine Possible

Modified Cycle Combined with Compound Expansion Suggested—Could Use Steam from Jackets to Modify Pressures

By Cole Newman

GERMANY is said to have just produced a Diesel aeroplane engine of the Junkers type weighing 3½ lb. per hp. It consists of double pistons in each cylinder working in opposite directions, giving a well-balanced engine practically free from vibration.

It has been demonstrated in this country that fuels heavier than kerosene cannot be successfully carbureted. At the same time there is a wide field for an engine capable of using kerosene and gas oil, and still be sufficiently light for automobile work. The Junkers aviation engine has proved, apparently, that this can be done.

Most people associate the Diesel engine with tremendously heavy construction. This is more or less true of large slow-speed engines, but the heavy construction is not so much on account of the high pressures as because of the necessity for accurate fitting of the various parts and accurate movement of some of the mechanical parts vital to proper functioning.

The compression pressures in small high-speed automobile engines average from 70 to 90 lb., according to the make and type. The maximum explosion pressures rise very suddenly to 300 or 400 lb. per sq. in.

Small Weight Increase

The engine would have to be very little, if any, heavier than at present, if designed for the Diesel cycle, because maximum pressure for the Diesel cycle is only about 100 lb. higher than the maximum actually reached in an automobile engine at the moment of explosion.

The subject has been considered with reference to automobile engines, but engineers hesitate to complicate the automobile engine with delicate injection apparatus. The amount of oil injected in the ordinary Diesel engine cylinder at each stroke is about equal in amount to the drop that would hang from the point of a pencil. The amount that would be injected each time into the cylinder of an automobile engine would be so small that it appears questionable whether it could be accomplished or not. Still, the Germans appear to have solved this problem, according to a statement made at the recent meeting of the American Society of Aeronautical Engineers.

Atomize Externally

It would seem more practicable to atomize these heavy fuels and mix them with the ingoing air, after which they could be exploded by the heat of compression. Such heavy fuels cannot be carbureted, that is to say, vaporized, without external heat. External heat reduces the density of the charge to such a point that the engine loses power, and the charge frequently preignites in the carbureter as well as in the engine cylinder. In fact, heavy fuels cannot be successfully and practically carbureted, because their physical characteristics lie outside of carburetion limitations. They can, however, be atomized, without external heat. External heat reduces the swift-flowing current of air.

An ordinary spark plug will not ignite such a mixture or even if it were ignited a great deal of smoke and carbon deposit would result. The compression of such a charge to high pressure, however, completely evaporates the finely atomized mist of fuel and finally ignites it. Several auxiliary features would be necessary for such an engine:

First: There must be means of controlling the point of ignition so as to prevent preignition. This might be accomplished either by varying the compression or by admitting a variable amount of water with the fuel. It would be necessary for variable compression to have either a telescopic cylinder or cylinder head in the form of piston which could be used to adjust the compression in accordance with the needs of the engine.

Second: The admission of water would be a much simpler means of controlling preignition. In fact, water injection is often used nowadays to prevent preignition of highly heated mixture, in conjunction with heavy-fuel carbon. Such engines would probably have to have powerful self-starters, but on the other hand they would ignite on the first turn or two. The admission of water and fuel could be controlled from the dash. A very little instruction would enable the most inexperienced person to control these two features. In fact, the fuel inlet would be the throttle valve, no other throttle valve being necessary. The water valve could be connected to the throttle valve and moved with it, having in addition a differential dash attachment which would compensate for hot and cold water through variable conditions. The use of water in conjunction with a combustible mixture to the Diesel cycle would make the compound gas engine possible and desirable. Compound automobile motors in the past have failed for two reasons:

Reasons for Failure

First: The temperature of the products of combustion is too high and their heat mass is too little to permit of their successful transfer from one cylinder to another before they collapse.

Second: The exhaust pressure between the two cylinders prevents the first cylinder from properly scavenging itself because of the relatively large clearance volume of a carbureting engine. This acting the same as back pressure with any gas engine prevents the engine from getting a full charge, and the greatest problem connected with the progress of automobile engines has been and is now the ability of the designer to get the contents of the cylinder in and out at high speed. With the same size cylinder and the same speed of engine, it is possible to raise a 30 to 40 hp. engine to 100 or 125 hp. simply by making special provision for admission and exhaust. It is not generally known that at extremely high speeds, automobile engines get only from one-quarter to one-third the amount of mixture that their displacement admits.

This type of Diesel engine, therefore, makes the compound engine possible.

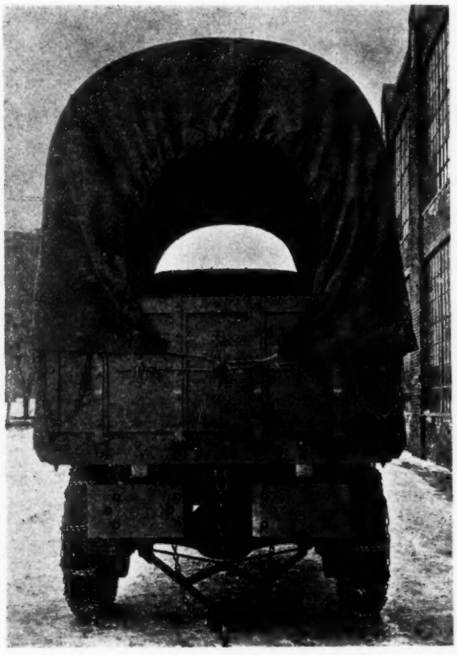
First: Because the temperature of the products of combustion exhausted from the first cylinder is converted

into heat mass by the presence of steam. These products by virtue of their high heat mass and comparatively low temperature are enabled to pass from one cylinder to another in the form of highly superheated steam preserving their pressures and temperature for useful work in the second cylinder.

Second: The clearance of a Diesel engine at the top of the stroke is so small that the receiver pressure has relatively little effect upon the proper scavenging of the engine, particularly a Diesel engine which draws in a mixture to be ignited by compression and not by a spark plug.

Some engineers have pointed out that there is no necessity for a gas engine to be compounded because a gas engine has more heat than it needs and there is hot water both in the exhaust and in the jacket water, and because compounding consists simply of splitting up the work which is normally accomplished in one cylinder only.

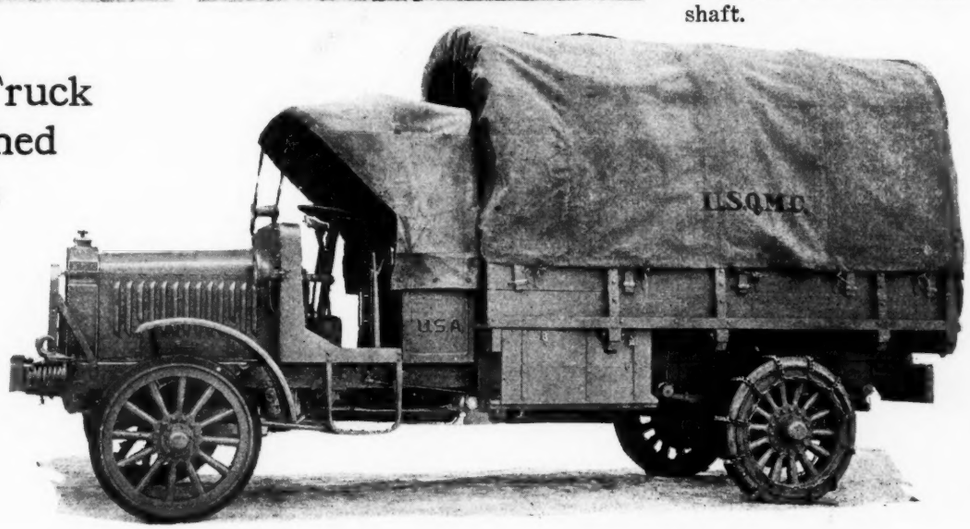
This is not entirely so. Many practical advantages could accrue from a properly compounded internal-combustion engine. Let us assume a six-cylinder internal-combustion engine, having four high-pressure cylinders of the four-stroke cycle type and two low-pressure cylinders receiving exhaust from one or the other cylinder at every stroke. Assume that the four cylinders operate on the Diesel cycle by means of an atomized mixture of air with heavy fuel ignited by compression and controlled by water admission. Assume in the first place that the high-pressure cylinders only are water-cooled and the low-pressure cylinders properly lagged, as in the case of any steam engine. Assume that the heat of the water is utilized by permitting it to boil in the jackets. The steam from this water is admitted to the carbureter. Such as is not needed can be by-passed into the radiator. Therefore, the greater part of the heat lost to the jackets is restored to the cylinder at a lower temperature but greater heat mass. It enters the cylinder with the mixture of fuel and air and controls the ignition point as desired. The mixture of the products of combustion with the greatly superheated steam after explosion passes through the exhaust valve to the low-pressure cylinder. The low-pressure cylinder, therefore, has not only that portion of the pressure derived from the high-pressure cylinder but also the heat of the steam from the water jacket and of the exhaust which is usually wasted, to turn into useful work. The cylinder also acts as a muffler, eliminating that apparatus entirely.



It is, furthermore, possible that the charge could be so completely expended by the low-pressure cylinder that considerably greater economy would be realized and a noiseless engine developed. It is not likely that a greater quantity of water would be used than fuel.

Such an engine would be flexible and powerful, combining as it would the economy of the internal-combustion engine with the flexible and heavy torque of the steam engine. Although a six-cylinder engine, it would give eight impulses per revolution of the crankshaft.

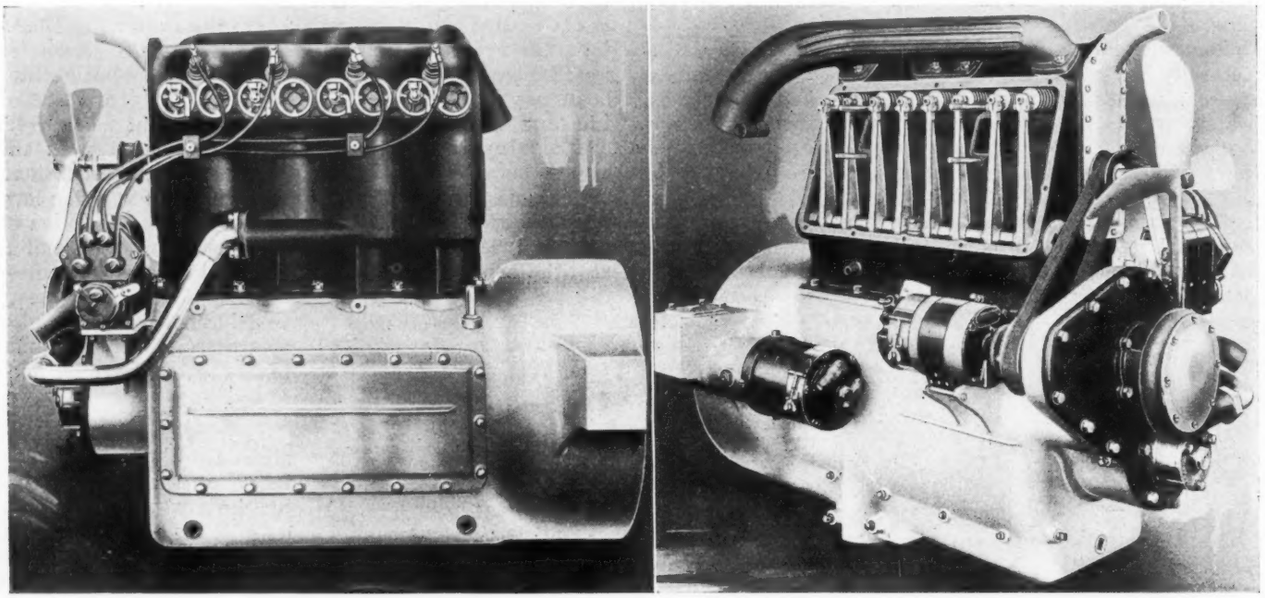
Class A Truck in Finished Form



Owing to the narrower seat and shorter hood the smaller truck is a much better looking vehicle than the Class B

Duesenberg Stock Engine

Powerful Four Cylinder for High-Grade Chassis—Follows Racing Practice—Two Valves Per Cylinder

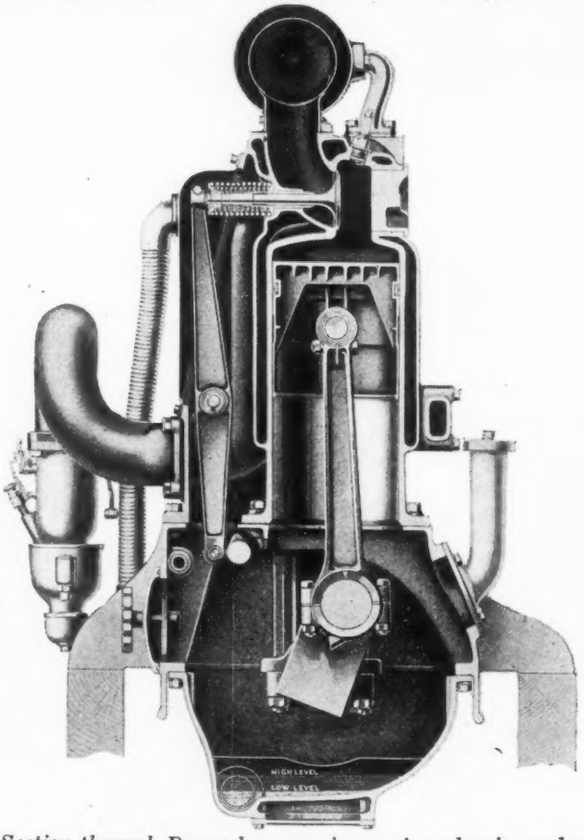


Left-hand view of engine, showing large hand hole in crankcase. Right-hand view showing valve rockers exposed

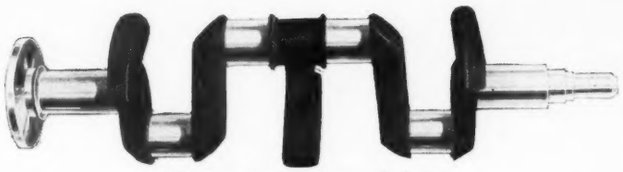
SO far the Duesenberg Motors Corp. has devoted its attention mainly to marine and aircraft engines, but owing to the many successes of the Duesenberg engine in automobile races it was to be expected that the automobile market would not be neglected. Now a new four-cylinder engine has been announced, coming in the 300 cu. in. class, with a bore of 3 63/64 in. and a stroke of 6 in. At 1000 r.p.m. this engine, which is known as the model G, develops 35 hp. and the power rises in an even curve to 80 hp. at 2100 r.p.m. The weight of this motor is approximately 490 lb. Its general characteristics are the same as those of the well-known Duesenberg racing motors. The cylinders are cast in a block and are designed with the Duesenberg form of combustion chamber and horizontal valve-in-head mechanism, which combination makes for high thermal efficiency. In addition to good workmanship on the wearing parts special attention is given to the finish of the motor.

Magnalite pistons are used, with liberal ribbing to carry the heat from the head to the skirt. There is only one compression ring on the piston, of a triple construction originated by the Duesenberg engineers, but in addition there is an oil wiper ring near the bottom end. The connecting-rods are of I section and are clamped to the piston pins, which latter have their bearings in the piston bosses. Four bolts secure each connecting-rod cap.

The crankshaft is supported in two main bearings, which is unusual for an engine of this size. It is 2 5/16 in. in diameter and the front and rear bearings are 3½ in. and 4½ in. long respectively. It is very rugged, and, in addition, is forged with integral counterweights. Lubrication is by the circulating splash system, the oil being circulated by a gear pump.



Section through Duesenberg marine engine, showing valve gear, short, direct gas passages and piston design



The two-bearing crankshaft

Magneto ignition is used, the magneto and water pump being driven from the camshaft gearing, which is helical. The pump is located at the forward end and delivers water to the jacket at the bottom, while the water return outlet is cast integral with a jacket cover plate at the forward end of the jacket. It has a four-blade aluminum fan driven by belt from the generator shaft.

The spark-plug is located so as to minimize the chances of external injury and at the same time insure the passage of fresh gas over the sparking points, thereby making starting easier.

In view of the fact that the Duesenberg Motors Corp. has contracted with the United States Government for a very large proportion of its total output, the production of automobile motors during the 1918 season will necessarily be limited, but definite allotments have been made to the Barley Motor Car Co. of Kalamazoo, manufacturers of the Roamer car; to the Biddle Motor Car Co. of Philadelphia, manufacturers of the Biddle car, and the Revere Motor Car Co. of Logansport, Ind., manufacturers of the Revere automobile. A limited number will also be supplied to the Wolverine Motor Co. of Kalamazoo, Mich., manufacturers of the Wolverine car.

Packard Convoy Leaves Detroit

The Start of the Train of 30 Trucks En Route to an Atlantic Seaport Under Full Military Operation and Conditions

Dawn found the train ready and waiting, the background being part of the Packard plant. At the right is the line-up just before the start and above is a picture of Captain Bronson, Quartermaster's Corps, in charge of the train

Japan Wants Small Chassis

Preference Shown for Inclosed Bodies Built in Japan—Cars Must Be Short Wheelbase—Narrow Tread Desirable—Good Accessory Demand

By H. Sibley

FROM a casual observation of the cars on the street in Japan it would be difficult to name any particular type that appealed to the Japanese buyer, for nearly every make and size is represented. At one time, when the total number of cars in Osaka was 32, all except 5 were of different makes, and those 5 were Fords. To be sure, the great majority of them are fitted with limousine bodies, 80 per cent of them in fact, but the chassis are long and short, large and small, and bear the brand of American, English, French, Italian and Belgian makers. And no inconsiderable number hail from Germany.

The aristocrat and the war millionaire buy the most sumptuous job they can get delivery on, and usually it is a large and costly car, while the prosperous merchant and importer contents himself with a medium-priced car, and the tradesman with the small, inexpensive outfit. But they all must have their limousine bodies.

Want Good Appearance

When the Japanese invests in a car it is partly to display material evidence of his prosperity and partly as a luxurious means of conveyance to and from his office, and for the prestige it affords him in rolling up to the formal social functions which figure so prominently in his life. He is not so fastidious as to what is under the hood, whether there are four cylinders or a dozen; so long as he is transported in comfort he is content. But he does demand that his car have a smart appearance, and in this he succeeds, for the Japanese limousines are as clean and bright as the best in this country, and have extremely smart and pleasing lines.

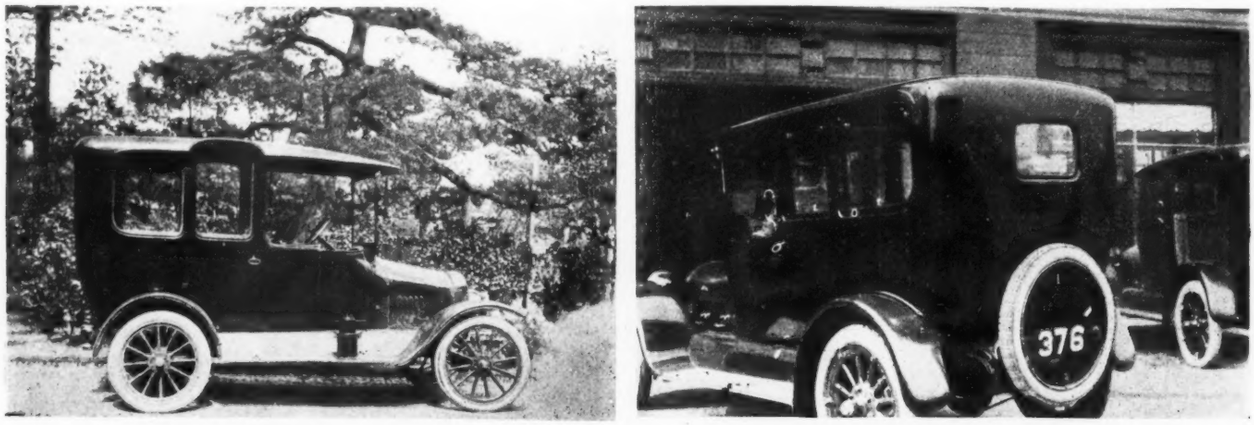
The open car does not appeal to him, even in hot weather, for he does not tour in the country. If he has an open car he will have the top up and the side curtains on, for the Japanese gentleman desires privacy on the street as well as in his home. Even when riding in a 'rikisha in fair weather he is often trundled about, completely enclosed. Perhaps another explanation for the universal use of the inclosed body is that the wind plays havoc with the loose kimono of men and women alike, and particularly with the elaborate coiffure of the dainty Japanese lady. This is very probable, for Tokyo is a disagreeably windy city, and with the inadequate street sprinkling system, the almost daily dust storms cause great discomfort to the unprotected motorist and pedestrian alike.

The demand for the closed body has developed a new industry in Japan, for the importers have found there is a considerable saving in freight by purchasing chassis only from the manufacturer in America, as well as a modest allowance for the body, and at the same time the Japanese purchaser can have a custom-built body to suit his individual taste. At least 50 per cent of the cars imported from America in the past year were shipped without standard bodies, and it is probable that in the future all cars imported will be chassis only.

Shops Have Body-Building Departments

The Japanese are traditionally expert in cabinet making, carpentry and lacquer work, all of which enter into the better class of automobile bodies, and the enclosed job costs the purchaser of a car from $200 to $600, which is much less than a special body in this country would cost. Nearly every motor car dealer in Japan has a body building shop in connection with his salesroom, and this department has become as much a part of their business as a repair shop. Some of these shops turn out as many as 30 completed jobs per month.

It is surprising what a smart appearance some of the old model cars have with these bodies. The writer has



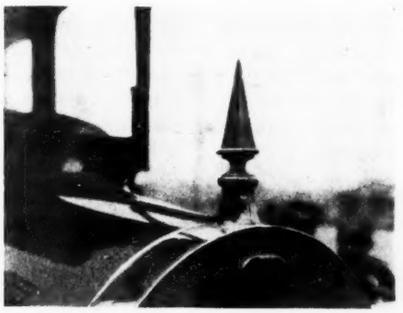
Left—A popular style of body in Japan—limousine body, Japanese make, on Ford chassis. This is known as "silk hat limousine" on account of arched door to make room for silk hat. Property of Post Wheeler, Chargé d'Affaires at American Embassy. Right—Buick, with Japanese body built by Yanase Garage

seen many chassis of 1909 and 1910 fitted with handsome bodies of Japanese design, and as far as appearances went, they might have been the very latest models, for the body builder did not stop at the dash, but added new lines to the hood and concealed other telltale features. Even some of the small cars of current model, which everyone in America can distinguish at a glance, had been so cleverly reconstructed that a minute inspection was necessary to discover the make.

Practically all the open cars in Japan are either in rental service or owned by members of the foreign colony. The Americans in Japan and the English are about the only nationalities that indulge in cross-country touring, and even then at rare intervals, so that the extent of this phase of motoring is scarcely worth mentioning. In Yokohama, the first port of entry for the great majority of foreign tourists, there is a larger proportion of open cars, for this class of trade prefers the open car, and also it can accommodate a larger number of passengers, to the garage man's profit. Hotels in Tokyo, Nikko, Kyoto, Kobe, Miyanoshita and Osaka maintain cars for the use of guests, but these generally are limousines.

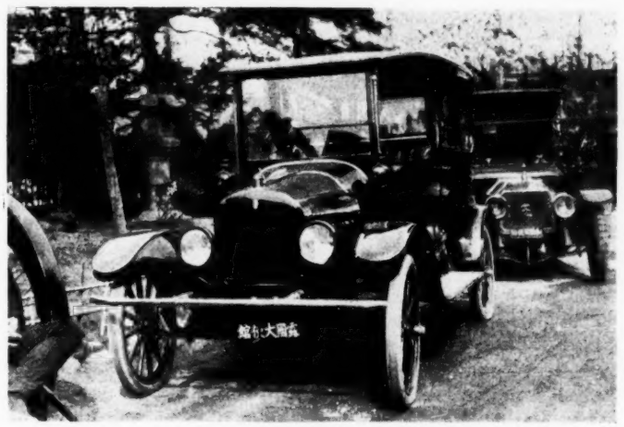
The taxicab companies which take care of travelers at the railroad stations employ conventional taxis, and the Motor Taxicab Co. of Tokyo, the largest of its kind in Japan, with a fleet of 90 cars, uses Ford taxicabs exclusively. It has 30 more coming on order, to take care of the rapidly increasing business.

Thus it is established that the inclosed car is overwhelmingly in favor with the Japanese, and that in the future 90 per cent of the cars imported from America will be without bodies, for the Japanese can more profitably build them in Japan. As for the type of car, the small, inexpensive automobile is going to find the greatest market. For all the great war prosperity, only a limited few are enjoying it directly, and the average Japanese merchant and small manufacturer cannot afford a car that costs over $1,500 or $2,000 in Japan, and a still more moderate price will fit his pocketbook to better advantage. Aside from the low cost of the small car, it appeals to his sense of neatness and daintiness. There is nothing ponderous in Japan; the houses are tiny, the gardens are like toy gardens, the streets are narrow, even the railroads and tramways are narrow gauge and the coaches about two-thirds the size of ours; in short, everything in Japan is designed on a diminutive scale, and therefore the Japanese wants his motor car in proportion. True, there is a market for the luxurious big limousine among the ultra-rich and aristocratic, but the average Japanese cannot reconcile himself to anything that is not compact and neat.



A characteristic radiator ornament

Main street in a poor country village



Ford with Japanese alterations. Note lines of hood, and metal covering over original radiator, also the splash guard brought down to conceal front spring

The small car has another advantage in that it is better adapted to road conditions. The car of short wheelbase can be more readily manipulated through the cramped and crowded streets of the cities and the narrow roads in the country, with the abrupt turns and the unstable bridges which a heavier car might crash through. Besides, the gasoline consumption is less, and this is a formidable item in a country where inferior grades bring from 40 to 45 cents per gallon. While there is very little country touring now, there is bound to be in the future, and when that time comes the small, light car will have the greatest demand.

Another branch of the motor car market that is just developing is for omnibuses to transport passengers in the resort districts some distance off the railroad trunk lines. At present the proprietors of these watering places operate a line of light cars with a special body, seating eight persons. Usually these are Fords, but as traffic increases and roads are improved in consequence, there will be a demand for a heavier car. Intercity transportation with motor cars very likely will develop in time, for the 7000 miles of steam railways are not nearly adequate to accommodate the sixty million persons in Japan. Horse-car lines for passengers and freight are operated in some sections, but these offer a tedious means of travel for towns that lie ten miles and more apart, and will surely be superseded by the swift and economical motor car in the near future.

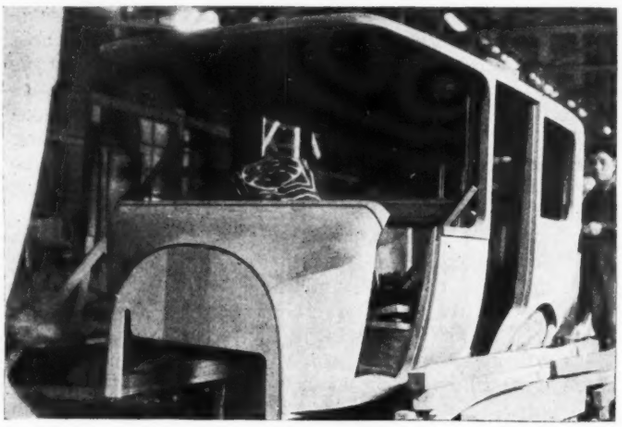
The present condition of the motor car market in Japan would hardly warrant the manufacturer in designing a car to meet Japanese road conditions, but one prominent importer in Tokyo was of the opinion that a narrow tread would be a great advantage in both city and country. The 'rikisha, with its 30-inch tread, threads its way readily through the narrow and congested streets of the cities, and a motor car proportionately narrow would find navigation of the crowded section much less difficult. In Osaka the writer encountered a street which a car could not even enter because it was so narrow, and this was the only avenue of access to a large manufacturing

plant. In the country the carts drawn by horses and coolies are approximately the same tread as the American motor car, but having only two wheels can easily negotiate the abrupt turns which necessitate much fancy driving on the part of the motorist. The cars which Japanese attempted to build were all of narrow tread and with small motors to meet the high cost of gasoline, but they were not a success, not on account of the special features, but because of the faulty Japanese construction and workmanship.

Good Accessory Demand

The Japanese have an almost childish fancy for accessories. The cars are fitted with every conceivable device. The motor car regulations, though not strictly enforced, require a bulb horn in addition to any other signal supplied as standard equipment by the manufacturer, and a few years ago an exhaust horn was required in addition. The result is that some cars have as many as five warning signals—exhaust, hand bulb, electric, and a mechanically operated hand and foot signal. At times one is disposed to think that all these are necessary, in trying to drive through a congested street in which the pedestrians pay no heed until the car is directly upon them. And the attendant din of these many signals is extremely annoying to the passenger, although they provide much entertainment, apparently, to the nonchalant chauffeur.

A maximum hand speedometer is likewise required by regulations, and the police in most cities are vigilant in seeing that the car is not without this feature. Although the police departments give each car a complete mechanical inspection every May, and if they find everything in proper working order attach an ornate metal plate to the dash, they are not as familiar with motor car mechanism as they would have the motorist believe. There is a manufacturer in Osaka whose car is equipped with a maximum hand speedometer, and it so happens that this particular owner employs a chauffeur much given to exceeding the speed limit. Often he is held up by a traffic cop, but on such occasions he puts his foot over the speedometer and directs the officer's attention to the ampere meter on the dash. And the obtuse officer, somewhat surprised to note that the ampere meter hand does not register forty miles an hour, is very apologetic and permits the speeder to pass on his way. This has happened not once, but scores of times.



Body for a Buick building in Yanase Garage

At present there are about 400 Fords in Japan, 80 Maxwells, as many Buicks and Overlands, while there has been much activity on the part of dealers representing Oaklands, Chevrolets, Chalmers, Hudsons, Paiges, Scripps-Booth, Davis, Hupmobiles, Cadillac, and scores of other well-known makes. Among the higher-priced cars one sees Packards, Locomobiles and Pierces, and the one Owen-Magnetic in Japan is owned by a struggling missionary.

American Car Popular

Among the foreign cars the Italian F.I.A.T., the French Renault and the German Protos predominate. Some enterprising German succeeded in disposing of a great number of the latter in Japan, and one is curious to know if it did not make its début in that country during the Paris-New York race, in which a Protos was a contestant. The English Daimler is much in evidence, and even the costly Rolls-Royce is seen occasionally. All of the foreign cars were imported before the war curtailed exports, but since that time the American high grade automobiles have found a very satisfactory market. Years ago, the importation of a number of indisputably inferior American cars very seriously affected the reputation of the American car in general, and it has taken some time to live that down. However, the American car stands pre-eminent, both in popularity and numbers.

Allen Interests Produce Truck

THE new Defiance trucks, placed on the market by the Turnbull Motor Truck & Wagon Co. of Fostoria, Ohio, will sell for $1,595, not including body, f.o.b. Defiance, Ohio. The Defiance truck will be marketed largely through the same sales organization which markets the Allen passenger cars. It will have the Allen 3¾ by 5-in., four-cylinder, block engine, with thermo-syphon cooling through a cast tank type of radiator.

Ignition is by the Eisemann high-tension magneto, and the carbureter is a Model M-1 Stromberg. The governor is a Monarch automatic. The fuel is fed by gravity from a 20-gal. tank under the driver's seat, the tank being supported at three points, rendering it free from distortion due to frame weaving. The drive is taken through a Borg & Beck three-plate disk clutch to a Grant-Lees three-speed gearbox mounted on S-K-F ball bearings on both main and countershafts. The gear reductions are 24 to 1 on the first speed, 13.8 to 1 in intermediate, and 8 to 1 on high, the final drive being the Torbensen internal gear axle having 8 to 1 ratio. The drive shaft unit is made up of two Arvac inclosed universal joints and a 2½ in. diameter tubular propeller shaft. The front axle is also a Torbensen I-beam having roller bearings in the hub.

The frame is pressed steel channel, 5⅝ in. deep, carried on semi-elliptic springs which are 54 by 2½ in. in the rear, and 42 by 2¼ in. in front. These springs are of alloy steels and contain bushings in all the eyes. The spring bolt diameter is 1 in. and is lubricated by wick type oiling. The wheelbase is 135 in. long and the length of the frame back of the cab is 115 in. The wheels are artillery type with fourteen spokes in front and rear and carrying 34 by 3½-in. front, and 34 by 5-in. rear tires, both solid. The weight of the chassis is approximately 3500 lb., and the load capacity, 1½ tons, exclusive of body weight.

The body types are furnished in six standard styles which are designed to suit any class of trade with a truck of this capacity. The standard equipment with the chassis includes driver's seat, front fenders and running boards, three oil lamps, tool kit and box, horn jack and odometer. The chassis and seat are painted in two coats of gray lead.

MANUFACTURERS' MERCHANDISING

Thoughtless Letters Lose Business

IF advertising is to produce to the limit, sales letters should tell a story at least as good as the publication advertising which they follow up. What an investigation showed was something quite different.

By Troy M. Rodlum

IT is seldom that sales letter types from an entire industry, wide-spread territorially and composed of many separate manufacturing units, can be put side by side and studied. When this is accomplished, many interesting and sometimes shocking things come to light.

A very good friend of mine confided in me some time ago that he was going to buy an automobile next spring. I asked him to write a letter to every car maker in the country whose name and address we could obtain. The varied kinds of answers we got, and the fluctuating degree of effectiveness of the letter appeals made the test quite prolific of ideas and data.

It would seem that, as there is so much money spent in the preparation and publishing of automobile advertising, it should be logical that these same lavish spenders would look carefully to their letter writing. And that the correspondence and follow-up systems which bring them and their product into intimate touch with the prospect (or *should* do so) would be equally well handled, and given the same amount of careful thought, if not more of it. What is the use of a good and effective introduction to a product if the intermediate and pre-closing steps, as well as in some cases the actual closing, is very ineffectively done?

Avoided Form Letters

It is about on a par with the salesman who is a brilliant and graceful "approach man," and yet is unable to talk product and customer-interest, and close the sale.

To get the best of results in this test I took care that my friend used very good engraved stationery and obtained the best of stenographic help in typing the letters. They were worded in such a way that the manufacturer could not reply with a routine form letter, and do justice to the opportunity for a sale. These things insured a good impression on the part of the manufacturer and whoever saw the letter, so that he would handle the correspondence with even more care and thought than the usual inquiry received.

Now let's see what we got: The number of automobile manufacturers written to was 119; 97 of them replied; 40 came back with a reply inside of five days; 41 of them inside of ten days; 6, fifteen days; 2, twenty days; 6, twenty-five days; 1, a full month, and 1 a month and 18 days. The one whose reply came *last* probably needed the sale the worst! Most of the makers who did not reply were little-known companies.

Sixty-seven of the 97 manufacturers wrote only one letter, sent their literature, and then forgot about it. Four of the houses sent catalogs, but no letter. Four of the manufacturers did not reply direct, but sent the letter to the distributor, who replied. Thirty followed up their first letter by one letter; 5 by two; 1 by four. Twenty of the territorial distributors followed up the manufacturer's letter. Twenty-eight distributors, who were referred to by the manufacturers, did not write to the customer. Thirty-two of the 97 manufacturers had no territorial distributor (this was in a middle western territory), but tried to make the sale direct. One manufacturer sold "Direct from Factory to Owner," as a policy.

The distributors and manufacturers in all wrote 138 letters. Thirty-five of the 138 letters were written in élite typewriter type, which, by reason of its smallness and compactness permits a much neater page with more white space and more opportunity to say a good deal without appearing to have a long letter than the standard pica type. All but 14 of the letters were in black ribbon.

Letters individually typed totalled 132; only four of the 138 were multigraphed, two sent out by manufacturers and two by distributors. This number would have perhaps been larger had the letter of inquiry been worded so as to properly permit anything but an individual reply. Yet one of the most successful growing car companies sent out the worst example of a multigraphed letter. It was poorly matched-in with a badly matching ribbon, and all done in a most careless and slovenly way. Even the thought in the letter was lacking in sales value. If this firm is to continue its evident success, some radical changes must be made in correspondence methods.

Forty of the 97 different car makers spelled the customer's name incorrectly; the letterhead on which the customer wrote his inquiry was engraved plainly with his full name, so that there was no excuse for this.

The letter from the home office of the largest national advertiser was an outstanding example of how not to do it, both as regards mechanical neatness and thought construction; there was none of either.

As to the actual sales talk used in the letters, 67 said practically nothing about the car they were selling! 23 stressed mechanical superiority; 6 stressed organization; 6 general satisfaction the car would give; 6 economy of operation; 6 style; 6 buy now, increase in price later

on; 5 lowness of price; 5 fact that they were oversold; 4 offered discount from list price; 2 used testimonials in their letter; 1 told the customer to ask the owner to verify his statements. Practically all who were located fairly close by invited a demonstration.

Stock Phrases

Seventy-two of the 138 letters began with a stock phrase like, "Replying to your favor, we beg to state," etc., or, "We are indeed pleased to acknowledge receipt," etc. Seventy-one of the 138 letters closed with a stock closing such as, "Thanking you for your letter, and trusting," etc.

Among the things well said (they were woefully few) were: "We are not, however, advising our distributors of your interest in the car, so you will not be bothered with requests for a demonstration. Please seek this at your pleasure." This was especially delightful to the customer. The Franklin distributor gets the prize for the best closing phrase, "Remember, there are two men to talk with about Franklin cars, the dealer who will give you the facts, and the owner who must either confirm the dealer's statements or refute them." Imagine the confidence getting value of that paragraph as contrasted with what follows:

Agency Offers

One said: "But if, on the other hand, you would be interested to act as agent in your *State* we would be pleased to further communicate with you and submit terms." (Italics are mine.) Imagine the confidence you would have in a firm who offered the agency for an entire *State* without any overtures on the part of the inquirer.

A distributor said: "Perhaps you are not interested in being a satisfied owner; if so, we beg you not to purchase a ——, for we are giving dollar for dollar value and backing it up with real service." He failed to say what that service was.

Three manufacturers tried to make a dealer out of the customer.

Another said: "We are cheerfully mailing you today," etc. Cheerfully! And, "We shall anxiously await your visit and," Anxiously! These folks must have put a great deal of thought into their letter writing.

One firm in a multigraphed reply ignored what the customer had asked and requested that he write them once more giving the same information that he had supplied them with in his inquiry.

The "Direct from Factory to Owner" firm thanked the customer in advance for his order!

An Awful Thought

Another: "We are taking the liberty of passing your name on to the ——, and *trust that they will see* that a —— car is the next one you drive." And such awkwardly stated thought is supposed to help sell an automobile.

Still another: "We feel that under the circumstances we are entitled to a reply to this letter. Awaiting same, we beg to remain." More tactless handling of the closing.

In one record breaker from a distributor of a really good car I counted thirteen errors in spelling and a host of grammatical mistakes. The thought was equally clumsy, and, taken all in all, the letter was more of a pitiful burlesque than selling talk readably handled.

And other glaring faults could be written about, but what has been related should tell the story. All these facts and data only go to show that if advertising is to produce to the limit, sales letters should tell a story at least as good as the publication advertising, by which the product is introduced.

Jordan Adds New Model

Geared for Higher Speed, Is Built Low and Has Boat Lines

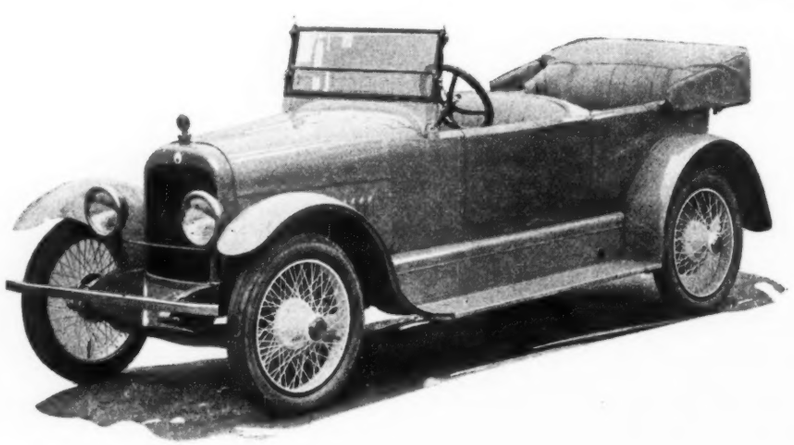
THE Jordan Motor Car Co. has placed on the market an entirely new model which is styled "Sport-Marine" and which is to sell for $2,375.

It is delivered to dealers with equipment that is far more complete than is usual, standard fittings including five Silvertown cord tires mounted on wire wheels, 75-mile speedometer, Macbeth lenses, Waltham sport clock, tonneau light, Moto-Meter, and bumper in addition to the usual windshield and top; curtains open with the doors.

The body is an entirely new design and is aluminum. It will be finished in optional colors such as Briarcliffe green and Ascot maroon. The body is built on the new straight-line idea with keenly bevelled edges, square doors, and the panelling in Honduras mahogany. The upholstery is a special bright hand-buffed leather and the tonneau is equipped with a velvet rug.

The chassis is similar to previous Jordan models except that it has a new Continental engine with increased bearing surfaces and a modern intake construction designed with a view to utilizing present day low grade fuel. Pistons are slightly longer than usual, thus eliminating piston slap, and there is a new camshaft and tappet design. The model is equipped with a special gear ratio to compensate for the small wheels and tires.

It will be noticed in the illustration that the top is so proportioned that it lies exceptionally flat and thus fits in with the general lines of the body. When erected it conforms equally well. The Jordan designers are to be congratulated.



Jordan Sport-Marine

Automotive Chronology for 1917

Important Developments in the Industrial and Financial Fields Arranged According to Date of Occurrence

JANUARY

1—Tire prices advance 15 per cent.
1—Society of Automotive Engineers appoints A. L. Riker of Locomobile and H. D. Church of Packard to serve on army board to prepare truck specifications.
1—Henry Barton becomes president of Northway Motor & Mfg. Co., Detroit.
1—1916 production of cars and trucks totals 1,617,708. Cars number 1,525,578 and trucks 92,130. Retail sales of cars total $921,378,000 and those of trucks $166,650,273.
1—L. E. Nutt retires from Velie Motors Corp., Moline, with which he has been connected for 15 years in charge of purchases.
1—Orlando Weber, vice-president of Maxwell Motor Car Co., Detroit, resigns.
1—War Department buys 2300 trucks costing $34,500,000 for use on Mexican border.
1—Petroleum output for 1916, 292,300,000 barrels, compared with 281,104,104 in 1915.
1—Kelly-Springfield Tire Co. wins Grant solid tire suit against B. F. Goodrich Co. and Republic Rubber Co. Court recommends payment of $376,353 in royalties on patent No. 554,675, issued Feb. 18, 1896.
8—Republic, Fisk and Michelin increase tire prices 4 to 25 per cent.
10—B. F. Goodrich Co. managed by committee of ten men; formerly handled by one.
10—Receiver for Alter Motor Car Co., Plymouth, Mich.
12—G. W. Dunham elected president of Society of Automotive Engineers at its Winter Meeting in New York.
12—Automobile makers confer on world's export trade. More than 40 export managers meet under auspices of National Automobile Chamber of Commerce.
13—Winton Motor Carriage Co. wins axle suit appeal. Court reverses decree in favor of Lindsay Auto Parts Co. on patent No. 748,760.
13—J. E. Baum succeeds C. Edward Murray as president of Empire Rubber & Tire Co., Trenton.
13—Gasoline prices 1 to 2 cents higher throughout country.
14—Italian Fiat absorbs U. S. A. Company. Heaviest stockholders in U. S. retain interests.
15—W. C. Teasdale becomes president of Federated Motors Co., which includes Empire and Pathfinder.
17—Passenger car manufacture in England stopped; gasoline 68 cents a gal.
18—Napier detachable wire wheel patent invalid.
19—Gasoline prices again raised. All section of country affected by increase of 1 to 5 cents per gallon.
22—C. M. Hall Lamp Co. buys Badger Brass Mfg Co., Kenosha, Wis., for $400,000. G. A. Yule, president of Badger company resigns. J. F. Hartz becomes president.
23—Freight congestion continues with no immediate relief in sight. Embargo declared in Detroit on all freight except coal, live stock and food products.
24—United Motors Co. buys radiator damper, owned by the Detroit Motor Appliances Co. and manufactured by the Harrison Radiator Co.
29—H. L. McClaren, former Mitchell-Lewis Motor Co. president, becomes president of Racine Rubber Co., succeeding Stuart Webster, resigned.

FEBRUARY

2—Sterling Engine Co. secures Sunbeam engine manufacturing rights for production in America.
10—Society of Automotive Engineers holds first aero session.
12—Fifteen airplane makers unite for defense. Aeronautic Mfg. Assn. formed to cooperate with government. Members have combined investment of $30,000,000 and can turn out 175 airplanes weekly.
14—Peerless, Studebaker and Cruiser offer plant facilities to war department.
19—F. E. Dayton becomes sales manager and a director of the Ajax Rubber Co., following retirement of J. C. Matlack.
19—Republic Motor Truck Co. in control of Torbensen Axle Co. Acquisition of stock in no way alters policy or management of axle company.
28—New York gasoline prices up 1 cent. Selling at 24 cents a gal., wholesale. Consumers paying 27 and 28 cents. Advances of from 1 to 5 cents during month.
28—Standard Roller Bearing plant in Philadelphia, sold to the Marlin Arms Corp.

MARCH

1—Court of Appeals holds Kardo front axle patent valid.
2—Saginaw Malleable Iron Co. will make castings for General Motors.
5—Goodrich and Diamond tire prices 2 to 11 per cent higher.
9—J. M. Quinby & Co., pioneer automobile body builder, retires from business and sells plant.
9—One car for every 29 persons in United States in 1916. Registered number 3,541,738 automobiles and trucks, a gain of 1,070,143 or 44 per cent over 1915.
14—Denmark prohibits automobile driving temporarily.
14—Holland declares embargo on automobiles.
17—J. M. Studebaker, Sr., dead. Founder and honorary president of Studebaker Corp.

APRIL

2—Tire prices up 5 to 15 per cent.
3—French embargo on cars prohibits importation, except for government use. Gasoline 92 cents a gal.
4—Detroit motor vehicle plants are ready for the closest co-operation with the government in war crisis. Armed guards protect buildings. Makers offer plants.
9—Price fixing held illegal. Supreme Court holds dealer may also sell article at desired price. Decision result of R. H. Macy Co.-Victor Talking Machine Case.
10—Willys-Overland receives government order for 4500 Curtiss airplane engines.
11—Willys-Overland Co. produces 44,409 cars in first quarter, compared with 47,465 in 1916 period.
13—Military truck specifications issued. Military board with assistance of S. A. E. greatly improve 1916 specifications.
16—Society of Automotive Engineers cuts summer meeting to 1-day session at Washington on account of war conditions.
17—Ford waives tractor patent rights. Meets British government request and cables specifications of each of the 1000 parts in tractor at his own expense.
18—E. A. Laboratories, Inc., buys business of Automobile Supply Mfg. Co., maker of Newtone horns. Plant sold for $137,500 to paint manufacturer.

MAY

3—S. A. E. adopts 24 new standards. Many more in progress.
22—United States asks bids from truck and car makers. $118,000,000 worth of these vehicles wanted in lots of one to 1000 for army work.
23—England adopts Ford tractor. Ministry of Munitions asks co-operation in building standardized product.
23—Holley kerosene vaporizers to be used on Ford tractors in England. Devices supplied to government at cost. Will establish a plant in Coventry.
25—Automotive Committee of the Council of National Defense Formed to Aid Government. Charles Clifton, chairman.
28—Howard Marmon called to Washington to motorize artillery and to aid field artillery development.

JUNE

1—First Unit of horseless artillery organized by United States Army.
2—Bosch Magneto Co. drops manufacture of electric systems to concentrate on magnetos.
2—Harry L. Horning, chief engineer of the Waukesha Motor Co., appointed head of Tractor Board of National Council of Defense.
4—All motor vehicle equipment for United States bought at Chicago depot of Quartermasters' Corps.
5—Howard Marmon appointed aircraft engineer of the Aircraft Production Board as Major in Signal Corps.
11—Howard Marmon ordered to France to study French aviation engines.
13—A. J. Slade, consulting engineer, placed in charge of transportation for the Aircraft Production Board.
16—Aircraft Manufacturers' Assn. to establish own standards in co-operation with S. A. E. Supplies on hand to produce 2500 airplanes.
17—W. G. Wall, vice-president and chief engineer of the National Motor Car & Vehicle Corp., assumes charge of designing and production of armored cars and tanks for the army. Commissioned a Major.
19—Willys-Overland Co. in control of Curtiss Aeroplane Co. John N. Willys becomes president of Curtiss company. Willys-Overland to manufacture airplane engines.
22—Eighty-seven truck makers bid for first 35,000 army transports for war department. Prices average $3.000 each.
26—Society of Automotive Engineers holds big summer meeting at Washington. Over 700 members and guests present at record war session.

JULY

1—Fageol Motors Co., Oakland, Cal., starts work on first unit of its new factory for cars, trucks and tractors.
2—Alfred P. Sloan, Jr., president of the United Motors Corp., takes over management of the Perlman Rim Corp.
3—D. McCall White, formerly chief engineer of the Cadillac Motor Car Co., appointed consulting engineer to the General Motors Co.
3—A. P. Brush, of the Brush Engineering Assn., appointed consulting engineer of Studebaker Corp.
5—Registrations for 1916 are 3,394,314 cars, 118,682 trucks, and 250,820 motorcycles. Automobile and truck registrations show increase of 1,067,332, or 43 per cent over previous year.
6—France prohibits importation of motor vehicles, including trucks and automobiles.
10—Fisk Rubber Co. buys assets of Gibney Tire Rubber Co., Conshohocken, Pa., for $408,187. Manufacture of solid tires to be continued.
11—Republic Rubber Co. acquires option on controlling interest on the Knight Tire and Rubber Co.
11—England contracts for 50,000 Ford tractors annually. Cork, Ireland, plant to be used for order. Two thousand men to be employed.
13—John N. Willys, president of the Willys-Overland Co., elected president of the Curtiss Aeroplane Co., succeeding John H. Curtiss, who becomes chairman of the board of directors.
14—Packard with aviation engine of 905 cu. in. displacement, makes 2 miles in 58 sec. at Sheepshead Bay Speedway. One mile mark made in 29 3-5 sec., or 121 m.p.h.; 4 miles in 1 min. 57 1-5 sec., or 122 m.p.h., and 6 miles in 3 min. flat, 120 m.p.h. Hornsted's mark of 29.01 for the mile in a Benz, June 24, 1914, still stands. Two-mile mark made by him in 58.99 broken. Resta's record of 2:20 for 4 miles made in a Peugeot at Sheepshead Bay, Oct. 9, 1915, broken.
14—E. H. Belden appointed chief engineer of Willys-Overland Co.
16—Franklin cars, numbering 179, average 40.3 m.p.g. in third 1-gal. mileage demonstration. One car went 82.8 miles on 1 gal. Six did better than 60.
16—R. H. Collins succeeds H. M. and W. C. Leland as president and general manager, respectively, of the Cadillac Motor Car Co.
17—Airplane bill appropriating $640,000,000 for building American aerial fleet and other army needs, passed by House of Representatives.

18—B. F. Everitt elected president of Springfield Body Corp., Detroit.
18—Government buys 10,550 trucks and 500 motorcycles.
20—War Department takes over military truck design. Entirely out of hands of Society of Automotive Engineers and the motor truck industry. After this year only standardized trucks to be bought.
24—Ajax tire winner of fourth annual tire mileage contest goes 37,482 miles. Average of 15,000 miles was made by the first fifty winners.
28—Packard of 265-hp. equipped with aviation engine, breaks all existing circular track records from ¼ mile up to 10 miles for cars of over 300 cu. in. displacement. Car driven by William Rader at Sheepshead Bay Speedway. One-quarter mile in 6.9 sec., or 130.4 m.p.h. Half mile in 13.95 sec., or 129 m.p.h. and the mile in 28.76 sec., or 125.1 m.p.h. Ten mile mark is 4:50.88 or 123.7 m.p.h.
31—Airplane makers pool patents and reach cross licensing agreement. Manufacturers' Aircraft Assn. formed so that litigation over patents will be eliminated and war work may proceed.

AUGUST

4—D. McCall White rejoins Cadillac Motor Car Co. as chief engineer, after acting temporarily in a consulting capacity to all of the General Motors sub-organizations.
6—Finance Committee reports favorably on $2,000,000,000 War Tax bill. The proposed license tax on motorcycles and automobiles to be based on original selling cost.
6—Goodyear Tire & Rubber Co. buys 13 acres of land in Brazil for a factory.
6—Goodyear Tire & Rubber Co. reports net sales for June at $11,601,200, as compared with $6,279,000 in June, 1916.
6—Motorcycle makers at annual convention at Atlantic City, N. J., develop army standards. Vote for centralized control and operation of military motorcycles.
4—Chalmers driven by Dawson establishes new 24-hr. record of 1898 miles at Sheepshead Bay Track. Former record of 1819 held by Hudson. Old 1-hr. record of 77 miles bettered by 6 miles and old 100-mile mark of 80 min. 21.40 sec., bettered, new mark being 70 min. 45.98 sec.
7—Willys-Overland Co. shows sales record of $13,611,775 for July, an increase of $2,500,000 for previous high record of June.
7—Navy plans $1,000,000 airplane factory at Philadelphia Navy Yard. Output first year to be 25,000 planes.
8—International Aircraft Committee decides on standardized steel for aircraft.
10—Motorcycle and Allied Trades Assn. decides to hold one Motorcycle show only during coming year. To be at Chicago, latter part of February.
11—Fisk Rubber Co. records sales for half-year of $15,714,971. This only $4,000,000 less than total sales of 1916.
13—Australia prohibits importation of complete motor vehicles and bodies. Chassis without bodies may be imported.
13—Standard Parts Co. net earnings for half-year more than 28 per cent on common stock.
14—June exports of motor cars, trucks and parts total $11,453,708, increase of $2,600,000 over June, 1916.
15—Major Henry Souther, former S. A. E. president and Senior Officer in Aircraft Engineering Dept., dies at Fort Monroe.
17—Ford Motor Co. announces contract for 200,000 airplane cylinders for government at rate of 1000 per day, at cost price.
18—Grant Motor Car Corp., Cleveland, acquires Denneen Motor Co. plant and business. Will build trucks.
22—Splitdorf Electrical Co., Newark, discontinues manufacture of starters. Will make ignition equipment only.
27—Chalmers Motor Corp. to raise $3,000,000 and lease Maxwell plant for five years. Management to be entirely in hands of Maxwell Motor Co., with Hugh Chalmers chairman of board.
27—Hupp Motor Car Co. earns net profits of $337,000 first half-year. Six months profits equal to 3.4 per cent on common stock after deducting 1916 fire loss.
28—Council of National Defense announces airplane contracts to be let on cost-plus basis.
29—United States places $25,000,000 order for airplane parts with Willys-Overland Co. Contract on twenty-eight week basis.
30—Military Motorcycle Standardization Committee standardizes spark plug thread and driving keys for magneto.
31—Willys-Overland Co. earns $6,000,000 in half-year, equal to 14.72 on common stock. Output for period, 91,489 cars.

SEPTEMBER

11—Christian Girl, president of Standard Parts Co. Cleveland, goes to Washington, to work with Military Truck Committee. Will confine efforts to production end of the new military trucks.
12—The standardized U. S. aviation engine passes successfully all government tests.
14—Exports of motor vehicles during July shows decrease of 33 per cent.
16—U. S. awards contract for construction of airplane engines totalling $2,700,000 to Nordyke & Marmon Co. Contract calls for delivery of 3000 engines by June, 1918.
17—Maxwell Motor Co. assumes complete charge of Chalmers Motor Co. under 5-year lease. Sherwood E. Hall is the new president.
17—Henry Ford & Son arrange for $20,000,000 tractor plant and blast furnaces at River Rouge.
18—Postmaster General advises experiments by Post-Office Department in operation of motor trucks near large cities for parcels post service.
18—Saxon Motor Corp. announces a gain of $1,313,668 during year ending June 30, 1917.
19—Committee of Automotive Transport of the Council of National Defense is reorganized with Harry L. Horning, chairman. To be known as Automotive Products Committee of the War Industries Board.
20—Senate bill amended to provide for motorization of parcels post service, and airplane mail service after war.
24—Packard Motor Car Co. increases price of cars $250. Marmon goes up $500.
25—Ford Motor Co. shows increase of $26,754,560 in total assets during year ending July 31, 1917, total being $158,834,779. More than $350,000,000 business transacted and 758,432 cars produced. Schedule for 1918 calls for 900,000 cars.
25—Litigation between Standard Parts Co. and Universal Rim Co. is terminated. Standard Parts Co. free to manufacture all rims covered by Baker group of rim patents.
26—William L. Colt made manager of Willys-Overland Co., New York branch.

OCTOBER

1—Maxwell Motor Co. earns $29 on common stock. Profits for fiscal year are $5,386,546.
1—Kelly-Springfield Tire Co. to erect $5,000,000 plant at Akron.
3—Maj.-Gen. George W. Goethals is made president of Wright-Martin Aircraft Corp.
3—Seven tire companies announce rise of from 5 to 15 per cent in quotations. Total rise since December now 50 per cent. The companies are Goodrich, United States, Diamond, Fisk, Ajax, Goodyear and Firestone.
3—De Palma sets new mark of 11:02.07 for twenty miles in Packard on Chicago speedway. Also establishes new mark of 28:09.38 for 50-mile event.
4—Willys-Overland Co. puts out new model to sell under $500.
4—Federal Grand Jury in New York returns indictment charging National Association of Automobile Accessory Jobbers with fixing prices and monopolizing accessory trade. Sixteen accessory manufacturers and twenty others named in indictment.
6—National Automobile Chamber of Commerce votes unanimously for elimination of cut-outs to go into effect Jan. 1. Hugh Chalmers elected first-vice president and H. H. Rice vice-president of gasoline division.
8—The Goodyear Tire & Rubber Co. establishes new sales record in August. Transactions of $12,577,000 listed.
8—Saxon Motor Car Corp. has net income for year of $663,768 as compared with $1,316,273 for preceding year.
8—General Motors Co. shows net profit for year of $30,000,000, compared with $28,789,560 for preceding period. Equals 34 per cent of common stock.
8—George W. Houk, wire wheel pioneer, dies in Los Angeles.
8—United States Rubber Co. shows record earnings of $7,239,966 in six months.
10—Society of Automotive Engineers adopts plans for from two to four winter meetings. Major activities to be in New York and Chicago shows.
12—General Motors profits are $3,225,000 for September, equal to 3.9 per cent on common stock for month.
12—Crow-Elkhart Motor Co. puts out five new models. Velie Motors Corp. has nine new ones.
13—Chevrolet Motor Co. to build $100,000 factory building and $30,000 addition in Detroit.
16—Mitchell Motors Co. is licensed by Four Wheel Drive Co., Clintonville, to make trucks for the government.
20—Hydraulic Pressed Steel Co. gains control over Canton Sheet Steel Co. Plans to consolidate all subsidiary interests. $4,000,000 involved in deal.
22—Essex Motors Co. takes 3-year lease on Studebaker plant in Detroit.
24—United Motors Corp. earns $6.85 a share for year, and shows surplus of $7,540,816.
26—Chandler Motor Car Co. earns $2,110,000, equal to $30 a share from Jan. to Oct. 1.
26—B. F. Goodrich Co. to issue $15,000,000 6 per cent, two-year notes to take up outstanding indebtedness.
27—Louis Chevrolet wins Harkness Gold Trophy race at Sheepshead Bay, in Frontenac, establishing new 100-mile record.
28—Congress passes War Revenue bill providing for 3 per cent tax on motor cars and motorcycles to be paid by manufacturers on price of vehicle as sold to distributer or dealer. Distributers to pay 1½ per cent on cars at hand.
29—Eddie Hearne wins 150 a lap, 168-mile Autumn Classic at Uniontown, Pa. Average speed of 9375 per hour. Hearne's Duesenberg only car to make a non-stop race.
31—Packard Motor Car Co. profits $5,400,691 for fiscal year. Surplus of $9,311,029.
30—Record day for Packard Motor Car Co. More than $1,000,000 orders received.

NOVEMBER

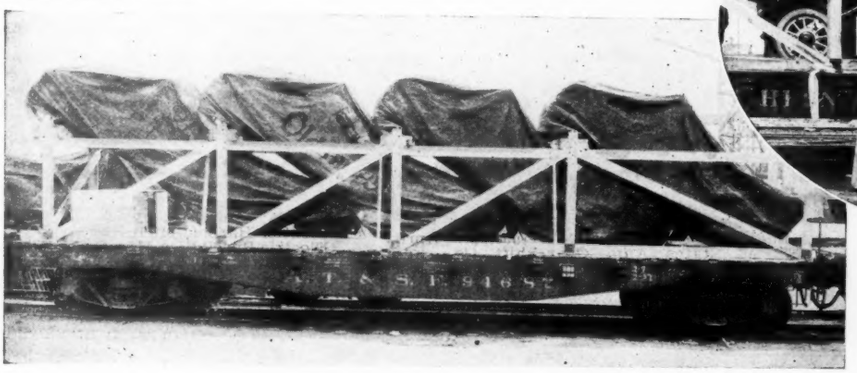
1—Dodge Brothers win suit against Ford Motor Co., compelling it to distribute $30,000,000 of profits instead of putting money into proposed blast furnaces at River Rouge.
1—Ground broken for 40-acre Dodge Brothers munitions factory at Detroit.
2—Hayes Mfg. Co. earns $390,444 in 14 months, increasing surplus to $540,000.
5—Howard E. Coffin is appointed chairman of Aircraft Production Board by the President.
7—John R. Lee, A. W. Copeland and Hugh Chalmers named to represent the automobile industry in Automotive Products Section of Council of National Defense.
7—Shipment of passenger cars in open top railroad cars prohibited.
10—Chandler Motor Car Co. reports net earnings of $25 per share for ten months ending Nov. 1. Surplus of $900,000 in bank.
10—Government seizes 600 machine tools worth $10,000,000 from warehouses.
10—De Palma establishes new hour record of 109 miles in Packard 12, at Sheepshead Bay.
16—Curtiss Aeroplane & Motor Corp. sales total $9,950,207 for nine months ending Sept. 30. Operating profit $2,713,639. New plant completed.
16—De Palma establishes record of 616 miles in 6 hours in Packard at Sheepshead Bay. Now holds all records from 10-616 miles.
19—Heavy duty war trucks tested by government. Average 3.95 M. P. G. and 125 miles a day, hauling 3½ ton load.
21—General Motors Co. receives large government contract for Liberty Motors and munitions.
20—Ford Motor Co. reaches highest point of production, manufacturing 3000 cars in one day; 800,000 cars to be turned out in November.
23—B. F. Goodrich Co. buys Wheeling Valley coal mines to protect against possible shortage.
23—Tests completed by Morgan & Wright, Detroit, on truck tires. 4288 mile trip, supervised by government engineers.
24—Contest board of A. A. A. votes to discontinue sanctioned racing during war. All contest rules suspended.
24—Pathfinding car leaves Detroit en route for Washington under supervision of Highways Transport Committee to determine best military highway route from Detroit eastward.
26—Fabrica de Automoviles, first company to make cars in Mexico, is established at Monterey.
30—Federal military guard to be organized for protection of automobile and other motor plants doing government work.
30—First Liberty Engine delivered to government.

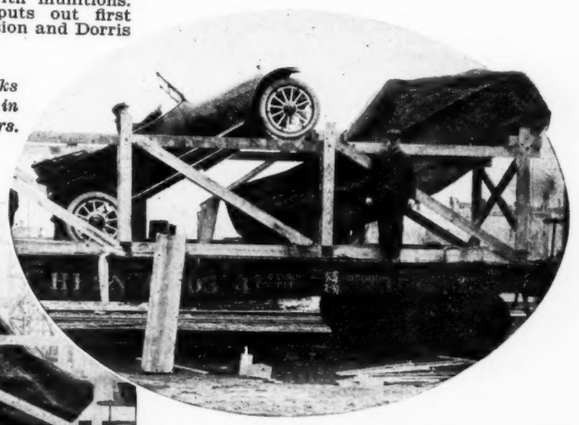
DECEMBER

1—Massachusetts Highway Commission decides to build military roads only during 1918.
3—Louis de F. Munger wins Rim patent suit against Perlman Rim Corp. May collect royalties.
3—Racine Motor Truck Co. to erect plant at Racine.

6—Courts decide finally that Ford Motor Co. must distribute $19,275,385, and must refund money spent on blast furnaces at River Rouge.
8—Maibohm Motors Co., Racine, adds light six chassis with four body styles.
10—October exports total $11,900,897. Thirty per cent gain over September.
10—S. A. E. has 2882 members.
10—Dealers co-operate with Commercial Economy Board of Council of National Defense in solving war problems.
10—Ministry of Munitions organizes deliveries in England. Centralized system in operation.
11—Contracts for assembly of 10,000 Class B war trucks placed by Military Truck Production Board.
11—All rubber imported in to United States must be consigned to Rubber Association.
11—Government to establish motor mail route between New York and Hartford.
12—Thirty military Packard trucks start drive from Detroit to Atlantic port. Transport train loaded with munitions.
14—Magnetic Motors Corp. puts out first model with Entz transmission and Dorris chassis.
15—First machine-made Liberty engine tested by government. As satisfactory as hand-made engines.
15—Scripps-Booth puts out new 6-cylinder model.

How the Olds Motor Works conserves railroad equipment in shipping automobiles to dealers.





19—Fuel shortage forces Jackson, Saginaw and Cleveland plants to stop temporarily.
19—Peerless Truck & Motor Corp., Cleveland, has net profits of $1,992,413 for 10 months. Equals $10 a share.
20—Reo Motor Car Co. and Maxwell Motor Co., divide government order for 6000 creeper type, 5-ton trucks.

Many New Companies Formed in 1917

Refinancing and Mergers Bring About Many Important Changes in the Automotive Industry

NEW COMPANIES

Air-O-Flex Automobile Corp., Detroit. $2,500,000. Suspension cylinders. August.
Ajax Forge Co., Superior, Wis. $1,750,000. Oct.
Akron-Biltwell Tire & Rubber Co., Akron, $300,000. Tires, tools and accessories. Oct.
American Magneto Co., Toledo. $400,000. Magnetos. Sept.
American Motor Car Co., Canton, Ohio. $100,000. July.
Angola Tire & Rubber Co., Buffalo, $1,000,000. Tires and rubber goods. Aug.
Argue Lamp & Appliance Co., Cleveland. $100,000. Lamps and accessories. May.
Armored Motor Co., Detroit. $100,000. May.
Atlanta Motors Corp., Dover, Del. $2,000,000. Cars and trucks. May.
Automotive Corp., Dover, Del. $10,000,000. Boats, engines, automobiles. August.
Auto Pedal Pump Sales Corp., New York. $100,000. Motor trucks and accessories. August.
Auto Safety Brake Corp., Bellingham, Wash. $300,000. Brakes. May.

Barnes Foundry & Mfg. Co., Detroit. $1,000,000. July.
Belknap, Inc., A. C., Newark, N. J. $100,000. Engines and parts. August.
Benoist Aeroplane Co., Canton, Ohio. $250,000. Airplanes and aeronautic equipment. Sept.
Bessemer Motor Truck Co., Dover, Del. $2,000,000. Trucks. May.
Bowen Products Corp., Auburn, N. Y. Airplanes and machinery. $2,500,000. Nov.
Boyd Motors Corp., Dover, Del. $5,000,000. Engines. June.
Brazil Motors Co., Brazil, Ind. Front drive truck. March.
Brisk Blast Mfg. Co., Monroe, Mich. $200,000. April.
Burgess Battery Co., Madison, Wis. $200,000. Dry batteries and accessories. March.

California Aviation Co., Los Angeles. $600,000. Airplanes. July.
Canton Auto Parts Co., Canton, Ohio. $100,000. Piston Rings. Jan.
Carlisle Cord Tire Co., Albany, N. Y. $550,000. Tires. May.
Chimock Tire & Rubber Co., Hackensack, N. J. $250,000. Tires. May.
Collier Motor Truck Co., Sandusky, Ohio. $150,000. Trucks. Feb.
Columbus Climax Rubber Co., Columbus. $200,000. May.
Community Mfg. Co., Los Angeles. $3,000,000. Farm tractors. Oct.
Consolidated Truck & Tractor Co., Detroit. $1,500,000. May.
Crank-Shaft Movement Corp., Green Bay, Wis. $300,000. Motors. Oct.
Cruiser Motor Car Co., Madison, Wis. $250,000. Convertible touring-camping automobile. Sept.

Darling Motor Co., Dayton, Passenger cars. March.
Dayton Airplane Co., Dayton. Airplanes. April.
Deppe Motors Corp., New York. $5,000,000. Engines. March.
Deshler Auto Spring Wheel Co., Deshler, Neb. $100,000. Wheels. April.
Doble-Detroit Steam Motor Co., Detroit. $10,000,000. Doble steam cars. May.
Dowse Rubber Co., Milwaukee. $2,500,000. Tires and mechanical goods. April.
Dual Carburetor & Mfg. Co., Cleveland. $100,000. Nov.
Durable Motor Truck Co., Hammond, Ind. $500,000. March.
Dural Rubber Co., Trenton, N. J. $200,000. Tires and tubes. June.

Elbert Tractor Co., Wilmington, Del. $5,000,000. Tractors. Nov.
Electric Auto Lite Corp., Dover, Del. $1,300,000. August.
Erickson Wheel Corp., Dover, Del. $5,000,000. Wheels. Jan.

Fabri-Cord Tire Co., Dover, Del. $2,000,000. Tires and rubber products. August.
Ford & Son, Henry, Dearborn, Mich. $1,000,000. Tractors. August.
Fostoria Pressed Steel Co., Fostoria, Ohio. $100,000. May.
Frankfort Carburetor Co., Frankfort, Ind. $250,000. Dec.

Glen Truck & Trailer Co., New York. $3,000,000. April.
Globe Motor Truck Co., St. Louis. $200,000. Globe trucks. Jan.
Gould Motor & Mfg. Co., Marion, Ind. $100,000. Engines. April.
Gould Motor Parts Co., York, Pa. $2,000,000. August.
Great American Truck & Tractor Co., Philadelphia. $250,000. June.

Halladay Motor Co., Mansfield, Ohio. $1,000,000. Passenger cars. March.
Hamilton Motors Co., Grand Haven, Mich. $500,000. Engines. Jan.
Hercules Motor Truck Co., Milwaukee. $100,000. Dec.
Higrade Motors Co., Grand Rapids, Mich. $250,000. Higrade truck. June.
Hinkley Motors Co., Detroit. $350,000. Engines. June.
Hoffman-Morgan Rubber Co., Chicago. $1,000,000. Tires. August.
Holmes Automobile Co., Canton, Ohio. $2,500,000. Air-cooled cars. Jan.

Imperial Auto Wheel Co., Wilmington, Del. $500,000. Automobiles and bicycles. Sept.
Iron City Products Co., Pittsburgh. ICP Piston Ring. July.

Kardell Tractor & Truck Co., Dover, Del. $1,000,000. Trucks, tractors and plows. April.
Kessler Motor Co., Detroit. Kessler airplane engine. May.
Kol-Ben Mfg. Co., Grand Rapids. $200,000. Demountable wheels. June.

Lamson Truck & Tractor Co., Dover, Del. $2,000,000. June.
Lapeer Tractor Truck Co., Lapeer, Mich. $100,000. March.
Laurel Motors Corp., Anderson, Ind. $2,000,000. Attachments for Fords. Nov.
Lawson Aircraft Corp., Green Bay, Wis. $200,000. Airplanes. April.
LeRoi Co., Milwaukee. $350,000. Passenger car engines. Jan.
Lewis Steel Products Co., Toledo. $100,000. Aug.
Lincoln Motor Co., Detroit. $1,500,000. Airplanes. Aug.
Line Drive Truck & Tractor Corp., Portland, Me. $4,000,000. Sept.

McCord Silent Sleeve Motors Co., Dover, Del. $200,000. Engines. Aug.
Mackey Motor Co., Akron. $250,000. Four wheel drive automobile. Oct.
Macon Motor Car Co., Macon, Mo. $600,000. Jan.
Marion Truck Corp., Marion, Ind. $1,000,000. Marion trucks. Jan.
Menometer Co., Chicago. $100,000. Metering device. April.
Michigan Crown Fender Co., Ypsilanti, Mich. $200,000. March.
Michigan Tire & Accessories Co., Grand Rapids. $100,000. March.
Motor Starter Corp., Long Island City. $2,000,000. Oct.
Mills Electric Co., Lafayette, Ind. $100,000. Boardwalk motor cars. May.
Nash Motor Co., Trenton, N. J. $100,000. Accessories. May.
National Paper Glass Co., Watertown, Wis. $100,000. Lenses, windshields, etc. Sept.
National Tire & Rubber Co., East Palestine, Ohio. $1,000,000. Tires and tubes. Feb.
National Tractor Co., Georgetown, Del. $2,500,000. Tractors and parts. Aug.

New York Rotary Motor Co., Albany, N.Y. $1,700,000. Three-wheel vehicles. Dec.
Oak Mfg. Co., Chicago. Passenger cars. May.
Oberlin Motor Truck Co., Cleveland. $1,250,000. April.
Oklahoma Auto Mfg. Co., Muskogee, Okla. $1,000,000 Sept.
Oliver Auto Device, Inc., Detroit. $100,000. Novelties. May.
Oneida Motor Truck Co., Green Bay, Wis. $300,000. Trucks. March.
One-Wheel Truck Co., St. Louis. Auto-Horse truck. Aug.
Permanent Products Co., Cleveland. $1,000,000. Metal products. Jan.
Picard Carburetor Corp., Detroit. $100,000. June.
Pan-American Motors Co., Indianapolis. $1,000,000. Passenger cars. April.
Parker Rustproof Corp., New York. $2,500,000. Aug.
Pittsburgh Rubber Tire & Mfg. Co., Denver, Del. $1,000,000. July.
Preston Motor Car Co., Dover, Del. $10,000,000. Engines. May.
Quickwork Co., Detroit. $400,000. May.
Racine Motor Truck Co., Racine. Trucks. June.
Reading Chassis & Motor Corp., Reading. $100,000. Engines and cars. Nov.
Redden Motor Truck Co., Jackson, Mich. $4,000,000. Redden-Truck-Maker. Feb.
Remy Brothers Tractor Co., Kokomo. $500,000. June.
Renno-Leslie Motor Co., Philadelphia. $750,000. Cars and tractors. April.
Republic Rubber Corp., Youngstown. $10,000,000. Tires. Oct.
Roach Automobile Rotary Safety Brake Co., Wilmington, Del. $1,000,000 Nov.
Saginaw Malleable Iron Co., Saginaw, Mich. $400,000. Feb.
Saginaw Auto Body Co., Saginaw, Mich $100,000. May.
Seamless Rubber Co., Inc., Boston. $1,500,000. June.
Silent Valve Motor Corp., Dover, Del. $3,500,000. Aug.
Springfield Motors Co., Springfield, Mass. $5,000,000. Trego aviation engine. Jan.
Standard Electric Light Co., Indianapolis. $100,000. Automatic light controls. Jan.
Standard Aircraft Corp., New York. $5,000,000. Nov.
Standard Equipment Co., Cleveland. $300,000. Bow sockets. May.
Standard Ignition Co., Elkhart, Ind. $200,000. Magnetos. Oct.
Star Tractor Co., Findlay. $100,000. Tractors. Aug.
Steamotor Truck Co., Chicago. $3,000,000. Steam trucks. May.
Supreme Motors Corp., Cleveland. $1,000,000. Airplane engines. May.
Tenailer Truck Co., Wilmington, Del. $1,000,000. Truck attachments. Sept.
Texas Motor Car Association, Cleburne, Tex. $1,000,000. Motor cars. Dec.
Titan Tire & Rubber Co., Batavia, N. Y. $1,200,000. Tires and rubber goods. Feb.
Titan Truck & Tractor Co., Milwaukee. $100,000. Aug.
Traffic Truck Corp., St. Louis. $500,000. Sept.
Transcontinental Motor Truck Corp., Buffalo. $1,250,000. Engines, trucks. Sept.
Trego Motors Corp., New York. $1,500,000. Airplanes and motors. March.
Turnbull Motor Truck & Wagon Co., Defiance, Ohio. $1,000,000. Trucks and trailers. Sept.
Union Tire Co., Dover, Del. $500,000. April.
United States Auto Gear-Shift Co., Eau Claire, Wis. $1,000,000. Nov.
United States Traction Wheel Co., Kokomo. $100,000. Tractor wheels. Nov.
Utility Tractor Co., New York. $1,000,000. April.
Victor Wire Wheel Co., Kalamazoo. $500,000. Aug.
Vichek Tool Co., Cleveland. $900,000. Tools. Dec.
Wager Aeronautical Motor Co., Cleveland. $200,000. Airplane engines. Aug.
Warnola Mfg. Co., New York. Warning signals. Jan.
Western Aero Corp., Newark, N. J. $250,000. Airplanes, engines. Aug.
Western Carburetor Co., Lansing. $100,000. Jan.
Western Engine & Dynamo Co., Milwaukee. $250,000. Aug.
Willys-Morrow Co., Toledo. $100,000. Parts. Feb.
Wilson Motor Car Co., Salt Lake City. $300,000. Sept.
Wire Wheel Corp. of America, New York. $5,000,000. Wire wheels. Jan.
Wisconsin Gear & Axle Co., Milwaukee. $100,000. Sept.
Wisconsin Duplex Auto Co., Clintonville, Wis. $500,000. Double drive trucks. May.
Wolverine Motors, Inc., Kalamazoo. $125,000. Passenger cars. July.
Woods Cushion Wheel Co., Cleveland. $500,000. Wheels. Jan.
W. J. B. Motor Truck Co., New York. $100,000. Engines. May.

Mergers

Benton Harbor Auto Machine Co., Benton Harbor, Mich.
Includes: Morrill and Morley Mfg. Co., Benton Harbor, Mich.
Electric Specialties Mfg. Co., Benton Harbor, Mich.
Capital $174,000.

Clyde Cars Co., Clyde, Ohio.
Includes: Krebs Commercial Car Co., Clyde, Ohio.
Clyde Cars Co., Clyde, Ohio.
Lincoln Motor Truck Co., Detroit.

Combined Motors Corp., Chicago.
Includes: Bour-Davis Motor Car Co., Detroit.
Shadburne Bros.

AUTOMOBILE SECURITIES QUOTATIONS RANGE THROUGHOUT THE YEAR 1917

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Ajax Rubber Co.	72½	69	67½	67¾	71	68	67	64	60	57	49⅜	46
J. I. Case T. M. Co. pfd.	85	82	81	83	81	80	..	78	..	..	..	..
Chalmers Motor Co., com.	25	25	24	17	..	9	9	8	3	2	2	2
Chalmers Motor Co., pfd.	..	..	..	..	..	..	..	..	..	..	..	..
Chalmers Motor Co., com.	99	96	101	93	92	87	80	81	76	72	61¾	63
Chevrolet Motor Co.	115	102	125	98	100	101	94	87	77	78	58¼	63
Curtiss Aeroplane	..	..	..	..	..	..	43	45	42	33	27	..
Fisher Body Corp., com.	37	35	35	..	34	34	36	35	30	25	21¼	20
Fisher Body Corp., pfd.	94	110	94	94	88	85	85	88	84	81	73¼	75
Fisk Rubber Co., com.	75	75	65	70	73	74	74	65	63	50	47½	..
Fisk Rubber Co., 1st pfd.	110	101	101	103	103	103	103	100	102	100	99½	98
Fisk Rubber Co., 2nd pfd.	90	95	70	92	92	92	92	92	96	85	76¼	63
Firestone T. & com.	140	136	141	132	130	115	120	115	114	98	97¾	96
Firestone, pfd.	107	107	107	106	106	105	103	102	102	99	98	97
General Motors Co., com.	750	108	118	102	110	118	114	111	98	95	87	90
General Motors Co., pfd.	120	88½	90½	86	88	88	84	84	82	78	74	74
B. F. Goodrich, com.	60	56½	55	48	52	51	54	47	45	42	35¾	35
B. F. Goodrich, pfd.	110½	109	108¾	107	106	105	104	103	100	100	94	94
Goodyear, com.	278	254	250	215	207	180	197	185	188	159	144	145
Goodyear, pfd.	107½	106½	106	106	106	105	105	105	102	99	109	95
Grant Motor Car Corp.	7	5	6	5	4	3	3	2	2	2	2	2
Hupp Corp., com.	3	6	4	3	3	3	2	2	2	2	2	2
Hupp Corp., pfd.	..	..	85	75	..	72	72	79	82	82	78	74
International Motor, com.	18	15	..	..	7	..	5	9	11	8	8	8
International Motor, pfd.	68	..	..	..	35	..	30	35	15	15	14	30
Kelly Springfield, com.	59	54¼	63	50	51	47	46	44	42	44	39½	39
Kelly Springfield, pfd.	92½	90	93	87	87	89	88	87	85	85	77½	73
Lee Rubber & Tire Co.	23	20½	22½	20	18	18	20	20	17	15	12	13
Maxwell Motor Co., com.	58½	55	52¼	48	51	49	34	32	34	32	23	25
Maxwell Motor Co., 1st pfd.	71¾	68	66¾	66	68	66	63	67	65	64	52½	55
Maxwell Motor Co., 2nd pfd.	38½	34¾	33	30	32	30	26	20	20	17	14	20
Miller Rubber Co., com.	248	250	230	215	200	180	175	165	175	140	114	123
Miller Rubber Co., pfd.	107½	105	105	104	104	102	102	102	100	99	52½	95
Packard Motor Car Co., com.	165	..	..	..	..	..	125	139	145	109	115	110
Packard Motor Car Co., pfd.	100½	..	..	..	..	95	94	94	96	92	93½	92
Paige-Detroit Motor Car Co.	40¼	38½	36¼	29	28	49	25	24	24	23	16	12
Peerless Corp.	17	14	14	12	15	16	14	13	13	10	10	11
Portage Rubber Co., com.	164	162	179	145	150	145	150	145	120	116	110	108
Regal Motor Car Co., pfd.	..	27	21	..	17	..	..	..	15	21	10	10
Reo Motor Car Co.	..	36¼	34½	27	28	27	25	25	25	21	17	16
Saxon Motor Car Corp.	64	52	57¼	49	40	20	16	16	13	8	5	5½
Springfield Body Corp., com.	..	70	70	62	51	52	5	2	..	..	..	..
Springfield Body Corp., pfd.	..	110	110	102	110	110	20	10	..	..	..	..
Standard Construction Co.	5½	6	9	..	13	11	11	9	8	8	8	9
Stewart-Warner Speed Corp.	99	84¼	81¼	73	74	71	63	55	58	58	47	45
Studebaker Corp., com.	108	104¼	101½	85	86	82	54	51	47	40	39	43
Studebaker Corp., pfd.	108½	106	105	104	101	98	91	..	..	90	84	..
Submarine Boat	..	..	..	..	..	..	..	28	19	16	13	..
Swinehart Tire & Rubber Co.	84	80	78¼	70	65	65	59	..	..	35	..	18
United Motors Corp.	47¾	40½	38¼	30	31	28	24	23	19	20	16	16
U. S. Rubber Co., com.	60¼	53¾	59	57	57	61	60	62	59	58	51	50
U. S. Rubber Co., pfd.	110¼	106	108	106	105	107	106	105	103	101	95	95
White Motor Co.	51	48¼	49	45	46	46	46	45	43	40	35	35½
Willys-Overland Co., com.	36½	32½	33¼	29	29	34	30	30	27	23	18	18
Willys-Overland Co., pfd.	97½	97½	97	95	93	92	96	94	87	..	95	70
Wright-Martin Aircraft	..	..	..	..	..	..	..	..	8	9	7½	..

Automobile Registration for First Six Months of Past 6 Years

State or Territory	1912	1913	1914	1915	1916	1917
Alabama	3,970	5,170	7,500	11,800	19,977	29,103
Arizona	2,085	1,037	4,104	5,426	9,743	17,400
Arkansas	3,366	3,000	4,895	7,200	12,300	24,200
California	78,603	108,156	107,173	138,600	187,519	249,168
Colorado	11,083	9,300	16,500	21,588	38,000	54,280
Connecticut	15,400	19,005	24,530	24,199	45,731	54,280
Delaware	1,780	2,118	2,608	4,135	5,438	9,557
District of Columbia	10,000	10,829	14,964	8,500	5,268	14,525
Florida	4,964	8,361	9,587	12,493	25,000	15,990
Georgia	15,900	21,210	19,000	22,150	31,259	58,030
Idaho	4,080	2,700	2,588	5,928	10,909	18,000
Illinois	47,104	76,039	115,000	151,832	203,757	285,000
Indiana	46,826	61,712	56,500	81,208	116,000	186,766
Iowa	38,009	55,601	88,557	117,407	169,558	243,184
Kansas	9,917	27,000	39,889	59,485	89,223	139,956
Kentucky	3,500	8,256	6,376	14,820	24,725	38,700
Louisiana	6,067	6,898	2,500	4,000	13,594	25,406
Maine	16,835	8,540	12,000	16,865	24,027	32,569
Maryland	9,100	12,355	18,248	24,732	26,868	50,454
Massachusetts	42,000	52,193	64,717	76,168	105,488	142,851
Michigan	34,588	47,198	65,517	93,669	132,000	200,000
Minnesota	25,000	39,000	61,950	82,000	122,000	168,000
Mississippi	1,800	3,000	1,500	8,500	16,500	26,046
Missouri	20,579	32,088	45,147	64,460	83,742	127,083
Montana	3,329	3,759	3,181	11,000	19,580	32,000
Nebraska	28,791	42,451	55,989	60,000	81,000	128,142
Nevada	720	823	1,265	1,190	3,900	6,650
New Hampshire	5,000	6,023	8,266	10,422	14,837	18,870
New Jersey	42,632	36,666	50,002	58,179	75,420	119,361
New Mexico	1,989	1,500	2,416	3,695	6,226	10,995
New York	92,407	110,618	140,653	185,767	259,105	345,936
North Carolina	5,000	8,678	11,600	16,315	24,460	39,806
North Dakota	7,900	8,697	15,020	24,000	33,669	54,466
Ohio	56,000	74,625	105,000	152,950	208,705	302,103
Oklahoma	4,659	8,000	14,000	25,000	46,000	72,500
Oregon	8,872	11,929	14,629	20,419	26,110	41,599
Pennsylvania	52,257	66,488	109,174	128,062	189,082	266,573
Rhode Island	6,517	6,173	11,000	15,000	19,427	26,000
South Carolina	8,366	10,500	12,975	16,000	18,000	29,000
South Dakota	13,492	10,913	16,200	22,700	37,240	55,000
Tennessee	7,464	12,200	17,282	24,951	26,437	43,000
Texas	20,588	38,000	70,000	72,433	105,000	200,000
Utah	2,290	3,299	5,396	6,615	10,729	17,190
Vermont	3,632	4,655	6,548	9,489	12,272	16,162
Virginia	4,797	7,406	11,642	17,799	31,272	45,050
Washington	10,589	20,000	20,636	35,000	44,607	68,282
West Virginia	2,244	9,249	6,158	12,000	15,771	25,083
Wisconsin	21,965	29,750	45,000	70,490	99,000	142,000
Wyoming	2,328	4,778	2,034	3,262	5,900	9,700

Connecticut Brass & Mfg. Corp., West Cheshire, Conn.
Includes: Connecticut Brass Corp., West Cheshire, Conn.
Pilling Brass Co.
Capital $3,600,000.

Detroit Valve & Fittings Co., Detroit:
Includes: Detroit Brass Works, Detroit.
Capital $2,000,000.

Detroiter Motors Co., Detroit.
Includes: Detroiter Motor Car Co., Detroit.
Capital $4,000,000.

Falls River Co., Kent, Ohio.
Includes: Kent Machine Co., Kent, Ohio.

Federated Motors Co., Indianapolis.
Includes Pathfinder Co., Indianapolis.
Empire Automobile Co., Indianapolis.
Capital $5,000,000.

Hal-Abbott Corp., Cleveland.
Includes: Hal Motor Car Co., Cleveland.
Abbott Corp., Detroit.

Marlin Arms Co.
Includes: Standard Roller Bearing Co., Philadelphia.
Rockwell-Drake Corp., Plainfield, Conn.
Mayo Radiator Co., New Haven, Conn.

North American Motors Co., Pottstown, Pa.
Includes: Potter Mackie Mfg. Co., Pottstown, Pa.
North American Motor Co., Pottstown, Pa.

Prest-O-Lite Co., Inc., Indianapolis.
Includes: Union Carbide Sales Co., Chicago.
National Carbon Co.

Republic Rubber Corp., Youngstown, Ohio.
Includes: Republic Rubber Co., Youngstown, Ohio.
Knight Tire & Rubber Co.

Standard Parts Co., Cleveland.
Includes: Perfection Spring Co., Jackson, Mich.
Standard Welding Co., Cleveland.
Bock Bearing Co., Toledo.
Western Spring & Axle Co., Detroit.

Springfield Motors Co., Stamford, Conn.
Includes: John Davenport Foundry Co., Stamford, Conn.
Amco Motor Co., Norwalk, Conn.

Refinancing

American Rubber & Tire Co., Akron. Capital increased from $500,000 to $1,000,000.

American Magneto Co., Monroe, Mich. Reorganized and capitalized at $400,000.

Be Saw Tire & Rubber Co., Hartville, Ohio. Capital increased to $1,000,000.

Bijur Motor Lighting Co., Albany. Capital increased from $650,000 to $2,000,000.

Briggs Mfg. Co., Detroit. Capital increased from $50,000 to $750,000.

Briggs & Stratton Co., Milwaukee. Capital increased from $50,000 to $250,000.

Brown Auto Carriage Co., Cleveland. Capital increased to $750,000.

Bulls Eye Thread Tire Co., San Francisco. Reorganized as subsidiary of Pacific States Tire & Rubber Co. Capital of $3,000,000.

Campbell Motor Car Co., Kingston, N. Y. Reorganization of Emerson Motors Co.

Chalmers Motor Corp., Detroit. (Old name Chalmers Motor Co.) Capital increased from $3,000,000 to $14,000,000.

Cleveland Tractor Co., Cleveland. Capital increased from $600,000 to $6,000,000.

Columbia Axle Co., Cleveland. Capital increased from $350,000 to $1,000,000.

Columbia Motor Truck & Trailer Co., Pontiac, Mich. Capital increased from $35,000 to $100,000.

Commercial Auto Body & Mfg. Co., Cleveland. Capital increased from $50,000 to $150,000.

Continental Motors Corp., Detroit. (Old name Continental Motors Co.) Capital $18,500,000.

Day-Elder Motors Corp., Newark. (Old name Day-Elder Motors Co.) Capital $1,000,000.

Dearborn Truck Co., Chicago. Capital increased to $550,000, $200,000 preferred.

Defiance Machine Works, Defiance, Ohio. Capital increased from $600,000 to $1,200,000.

Detroit Auto Dash Co., Detroit. Capital increased from $30,000 to $100,000.

Detroit Battery Co., Detroit. Capital increased from $60,000 to $500,000.

Detroit Motor Appliance Co., Detroit. Capital increased from $45,000 to $225,000.

Dodge Bros., Detroit. Capital increased from $6,000,000 to $10,000,000.

Dort Motor Car Co., Flint. Capital increased from $500,000 to $1,500,000, $1,200,000 common. $300,000 preferred.

Duesenberg Motors Corp., Edgewater, N. J. (Old name Duesenberg Motors Co., St. Paul, and Loew Victor Engine Co., Chicago.) Reorganized and capitalized at $1,500,000.

Dyneto Electric Corp., Syracuse, N. Y. (Old name Dyneto Electric Co.) Reorganized and capitalized at $500,000.

Eagle Mfg. Co., Appleton, Wis. Capital increased from $200,000 to $500,000.

Edison Storage Battery Co., West Orange, N. J. Capital increased from $3,500,000 to $5,000,000.

Electric Auto-Lite Corp., Indianapolis. Capital increased from $13,000,000 to $15,000,000.

Electric Welder Co., Lansing. Reorganized and recapitalized.

Emerson Motors Co., Kingston, N. Y. Reorganized and capital increased $3,491,498.
Engel Aircraft Co., Youngstown. Capital increased from $10,000 to $3,000,000.
Evinrude Motor Co., Milwaukee. Capital increased from $350,000 to $600,000.
Federal Motor Truck Co., Detroit. Capital increased from $500,000 to $2,000,000.
Ferro Machine & Foundry Co., Cleveland. Capital increased from $1,000,000 to $1,750,000.
Field Motor Co., Grand Rapids, Mich. Reorganized with a capital of $300,000.
Finley Robertson Porter Co., Port Jefferson, L. I. Reorganized, capital increased from $100,000 to $250,000 preferred stock, p.v. $100. 10,000 shares Com. n.p.v.
Ford Tractor Co., Minneapolis. Reorganized and capital reduced from $10,000,000 to $1,000,000.
Gier Pressed Steel Co., Lansing. Capital increased from $500,000 to $1,000,000.
Gillette Rubber Co., Eau Claire, Wis. Capital increased from $1,000,000 to $2,500,000.
Glidden Varnish Co., Cleveland. Reorganized with $2,500,000 capital.
B. F. Goodrich Rubber Co., New York. Capital reduced from $87,300,000 to $86,400,000.
Gordon Rubber Co., Canton, Ohio. Capital increased from $600,000 to $1,000,000.
Gramm-Bernstein Co., Lima, Ohio. Capital reduced from $4,000,000 to $1,500,000.
Guide Motor Mfg. Co., Cleveland. Capital increased from $100,000 to $150,000.
Hale & Kilburn Co., Philadelphia. Reorganized with capital of $1,000,000.
Harrow Spring Co., Kalamazoo, Mich. Capital increased from $500,000 to $600,000.
Hayes-Ionia Co., Ionia, Mich. Capital increased from $152,500 to $757,500.
Hercules Motor Mfg. Co., Canton, Ohio. Capital increased from $500,000 to $800,000.
Hercules Motor Truck Co., Milwaukee. (Old name Stegeman Motor Car Co.) Reorganized with capital of $100,000.
Hess Pontiac Spring & Axle Co., Pontiac, Mich. Capital decreased from $145,000 to $1,000,000.
Hewitt Rubber Co., Buffalo, N. Y. Capital increased from $500,000 to $1,000,000.
Highland Body Mfg. Co., Cincinnati, Ohio. Capital increased from $81,900 to $150,000.
Hood Rubber Co., Watertown, Mass. Preferred stock increased from $2,750,000 to $3,750,000.
Hydraulic Pressed Steel Co., Cleveland. Capital increased from $2,700,000 to $5,700,000.
Jenkins Vulcan Spring Co., St. Louis. Capital increased from $50,000 to $200,00.
Jones Motor Car Co., Wichita, Kan. Capital increased from $500,000 to $2,500,000.
K. D. Carburetor Co., Cleveland. Reorganized with a capital stock increase of $275,000.
Kerosene Burning Carburetor Co., Detroit. Capital increased from $200,000 to $300,000.
King Trailer Co., Ann Arbor, Mich. Capital increased from $50,000 to $150,000.
Krebs Commercial Car Co., Clyde, Ohio. Capital increased from $100,000 to $500,000.
Kunz Wheel Co., Milwaukee. (Old name J. L. Kunz Machinery Co.) Capital increased to $100,000.
Lakey Foundry & Machine Co., Muskegon, Mich. Capital increased from $70,000 to $400,000.
Laurel Motors Corp., Anderson, Ind. (Old name Laurel Motors Co.) Reorganized.
Lewis Steel Products Co., Toledo. (Old name Lewis Foundry Co.) Capital increased to $100,000.
Lozier Motor Co., Inc., Lansing, Mich. Capital reduced from $500,000 to $200,000.
McCord Mfg. Co., Milbrook, N. Y. (Old name Detroit Mfg. Co., Detroit.) Capital $1,375,000.
Mansfield Tire & Rubber Co., Mansfield, Ohio. Capital increased from $300,000 to $1,350,000.
Martin Truck & Body Corp., York, Pa. (Old name Martin Carriage Works.) Reorganized.
Mason Tire & Rubber Co., Kent, Ohio. Capital increased from $1,000,000 to $3,000,000. Common $1,000,000. Cumulative Pfd. 7 per cent $2,000,000.
Metal Mfg. Co., Detroit. Capital increased from $10,000 to $100,000.
Michigan Storage Battery Co., Detroit. Capital increased from $50,000 to $100,000.
Monitor Motor Car Co., Columbus, Ohio. Capital increased to $1,000,000.
Monroe Motor Co., Pontiac, Mich. Capital stock increased from $1,000,000 to $2,000,000.
J. W. Murray Mfg. Co., Detroit. Capital increased from $500,000 to $1,000,000.
Northwestern Chemical Co., Marietta, Ohio. Capital increased from $20,000 to $150,000.
Novo Engine Co., Lansing, Mich. Capital increased to $1,000,000.
Oakes Co., Indianapolis. Capital increased from $250,000 to $450,000.
Olympian Motors Co., Pontiac. Capital increased from $1,000,000 to $2,000,000.
Pathfinder Co., Indianapolis. Recapitalized at $5,000,000. Common $3,000,000. Preferred $2,000,000.
Piston Ring Co., Muskegon, Mich. Capital increased from $13,000 to $750,000.
Plymouth Motor Castings Co., Lansing, Mich. Capital increased from $75,000 to $250,000.
Portage Rubber Co., Barberton, Ohio. Capital increased from $2,000,000 to $10,000,000.
Prest-O-Lite Co., Indianapolis. Capital increased from $800,000 to $1,000,000.
Pullman Motor Car Co., York, Pa. Reorganized with $3,000,000 capital.
Pyrene Mfg. Co., New York. Capital increased to $3,050,000.
Ravenna Rubber Co., Cleveland. Capital increased from $100,000 to $250,000.
Redden Motor Truck Co., Jackson, Mich. Capital increased to $10,000,000.
Republic Motor Truck Co., Alma, Mich. Capital increased from $1,312,500 to $1,500,000.
Republic Rubber Corp., Youngstown, Ohio. (Old name Republic Rubber Co.) Reorganized. Capital $10,000,000.
Rich Steel Products Co., Battle Creek, Mich. Capital increased from $100,000 to $250,000.
Rubber Goods Mfg. Co., Trenton, N. J. Reorganized as subsidiary of U. S. Rubber Co. Capital decreased from $50,000,000 to $100,000.
Rush Motor Co., Philadelphia. Capital increased from $500,000 to $2,000,000.
Russel Motor Axle Co., Detroit. Capital increased from $600,000 to $750,000.
Saginaw Motor Car Co., Saginaw, Mich. Capital increased from $100,000 to $1,000,000.
Sanford Motor Truck Co., Syracuse, N. Y. Reorganized.
Schlieder Mfg. Co., Detroit. Capital increased from $100,000 to $350,000.
Scripps-Booth Corp., Detroit. Capital increased from 70,000 to 120,000 shares n.p.v.
Sebring Tire & Rubber Co., Sebring, Ohio. Capital increased from $200,000 to $500,000.
Shotwell Pump & Tank Co., Indianapolis. Capital increased from $60,000 to $100,000.
Shuler Axle Mfg. Co., Detroit. Capital increased from $100,000 to $150,000.
Silvex Co., Bethlehem, Pa. Reorganized with $2,000,000 capital.
Spranger Wire Wheel Co., Detroit. (Old name Spranger Rim and Wheel Co.) Capital increased from $100,000 to $300,000.
Springfield Body Corp., Springfield, Mass. Capital stock increased to $3,250,000. $750,000 cumulative 8 per cent Pfd. $1,000,000 8 per cent Cumulative Pfd. $1,500,000 Com.
Standard Four Tire Co., Keokuk, Iowa. Capital increased to $3,500,000.
Standard Roller Bearing Co., Trenton, N. J. Reorganized as subsidiary to Marlin-Rockwell Co., New York. Capital reduced from $8,000,000 to $160,000.
Standard Screw Products Co., Detroit. Capital increased from $100,000 to $250,000.

Exports of Cars, Trucks and Parts for 4 Years

1914

Mo.	Cars	Value	Trucks	Value	Parts
Jan.....	2481	$2,172,392	45	$74,491	.....
Feb.....	3837	2,378,494	57	83,461	.....
Mar.....	3538	2,984,915	50	63,932	.....
Apr.....	3239	2,760,478	52	72,678	.....
May.....	3157	2,857,601	141	236,383	.....
June....	1982	1,870,882	90	120,257	$473,968
July.....	1265	1,143,419	50	106,400	420,975
Aug.....	385	441,879	66	124,016	196,527
Sept.....	646	597,904	128	294,288	34,618
Oct.....	732	678,387	672	2,286,964	237,116
Nov.....	776	634,659	842	2,244,518	353,567
Dec.....	1297	998,698	1279	3,387,729	300,986

1915

Mo.	Cars	Value	Trucks	Value	Parts
Jan.....	1803	$1,313,163	935	$2,545,527	$615,185
Feb.....	2230	1,785,330	1002	3,022,482	564,976
Mar.....	2429	1,958,302	1339	4,725,463	762,368
Apr.....	3078	2,804,741	2267	5,240,481	1,807,567
May.....	4921	3,971,403	2426	6,583,912	789,826
June	4418	4,785,998	2990	8,587,802	1,139,182
July	4118	3,835,437	2469	6,803,001	1,663,997
Aug.	3839	3,121,834	1614	4,387,193	2,038,321
Sept.	4299	3,215,459	2227	5,882,255	1,613,419
Oct.	3479	2,749,255	1596	4,307,190	1,819,950
Nov.	3690	2,791,507	1553	3,837,307	1,693,787
Dec.	3664	2,710,758	1664	3,920,533	1,791,805

1916

Mo.	Cars	Value	Trucks	Value	Parts
Jan.	4520	$3,044,995	1269	$3,416,818	$1,800,621
Feb.	5651	4,063,429	2063	6,170,367	2,173,409
Mar.	5539	3,726,929	1878	4,909,179	1,858,247
Apr.	6242	4,998,350	1790	5,294,801	1,399,794
May	6275	4,069,690	1717	4,357,338	2,426,206
June	4905	3,416,396	1416	3,551,148	1,886,746
July	5258	3,663,563	1243	3,062,670	1,630,111
Aug.	5254	3,574,385	1565	4,442,158	2,051,895
Sept.	3585	2,819,405	1835	5,203,215	2,095,188
Oct.	4880	3,756,768	1144	3,635,291	1,949,060
Nov.	5337	4,016,930	1655	5,175,114	2,151,434
Dec.	4911	3,658,650	1331	3,688,614	1,755,335

1917

Mo.	Cars	Value	Trucks	Value	Parts
Jan.	4733	$3,860,224	1340	$3,515,210	$2,194,312
Feb.	3148	2,278,090	789	2,311,344	1,669,115
Mar.	5755	4,025,389	1040	2,961,389	3,044,195
Apr.	7276	5,166,640	1038	2,416,368	2,157,981
May	6725	5,489,980	1764	3,216,620	2,715,696
June	7609	5,721,494	1245	2,965,254	2,766,960
July	5081	3,621,539	1386	3,561,583	2,139,938
Aug.	3697	3,283,354	838	2,289,307	2,415,554
Sept.	4077	3,645,280	1251	3,675,717	1,802,251
Oct.	5536	4,481,127	1333	4,374,470	3,045,300
Nov.	....	.....	....	.....	.....
Dec.	....	.....	....	.....	.....

Standard Steel Castings Co., Cleveland. Capital increased from $125,000 to $1,000,000.

Standard Steel Tube Co., Toledo. Capital increased from $150,000 to $600,000.

Standard Tire & Rubber Mfg. Co., Willoughby, Ohio. Capital increased from $400,000.

Stanley Motor Carriage Co., Newton, Mass. Reorganized. Capital $2,500,000 Pfd. $100,000 Com. n.p.v.

States Motor Car Co., Kalamazoo, Mich. Reorganized and capitalized at $6,000,000.

E. G. Staude Mfg. Co., Pierre, S. D. Reorganized and capital increased from $150,000 to $5,000,000.

F. B. Stearns Co., Cleveland. Capital increased from $100,000 to $2,000,000. $1,250,000 Com. and $750,000 7 per cent Cumulative Pfd.

Stewart Motor Corp., Buffalo, N. Y. Capital increased from $325,000 to $1,000,000.

Swinehart Tire & Rubber Co., Akron, Ohio. Capital increased to $1,500,000. $1,000,000 in common and $500,000 in preferred.

Texas Co., Houston, Texas. Capital increased from $44,000,000 to $50,000,000.

Tubeless Tire & Rubber Co., Millersburg, Ohio. Capital increased from $75,000 to $1,000,000.

United States Rubber Co., New Brunswick, N. J. Working capital increased by purchase of $60,000,000 bonds.

Uni-tube Auto-Radiator Corp., Rochester, N. Y. Capital increased from $200,000 to $500,000.

Wadsworth Mfg. Co., Detroit. Capital stock increased from $250,000 to $650,000.

Wagner Electric Mfg. Co., St. Louis. Capital increased from $2,000,000 to $5,000,000.

Weidely Motors Co., Indianapolis. Capital increased from $700,000 to $1,200,000.

Western Electric Co., Trenton, N. J. Capital increased from $15,750,000 to $30,750,000.

Westlake Machine Co., Toledo. Capital reduced from $1,500,000 to $250,000.

Whitman Bull Tractor Co., St. Louis. Capital increased $600,000.

Williams Foundry & Machine Co., Akron, Ohio. Reorganized and capital increased to $2,500,000.

Wisconsin Motor Mfg. Co., Milwaukee. Capital increased from $350,000 to $1,000,000. $,00,000 in common, $300,000 in preferred stock.

Wright-Dayton Aeroplane Co., Dayton, Ohio. Capital increased from $500,000 to $1,000,000.

Kissel-Silver Specials

C. T. SILVER, New York distributer for the Kissel, has developed a series of special bodies which will be mounted on a new six-cylinder chassis equipped with a unit powerplant of Kissel construction. This has a bore of 3 5/16 in. and a stroke of 5½ in. The cylinders are of the L-head, all valves being located on the right hand side, and are cast in a single block integral with the upper half of the crankcase. Helical gears are used for driving the camshaft. A gear pump submerged in the oil sump is used for circulating the oil, which is fed direct to the main bearings. All other parts of the engine are lubricated by splash. A Stromberg 1½-in. carbureter is fitted. It is of the side outlet type and is provided with a hot air pipe. The cooling water is circulated by the usual centrifugal pump. The entire electrical equipment is of Remy make, the timer and distributer being built integral with the generator. A Willard storage battery is carried. All the lamps are of the bullet type and are nickel plated.

The clutch is of the conical type which has long been used by the Kissel manufacturers. The transmission is selective, giving three forward speeds, and is built integral with the engine. Spiral bevel gear final drive is used, in conjunction with the Hotchkiss drive. The final gear reduction is 4.58:1. The wire wheels are fitted with 32 by 4½-in. cord tires, either Goodyear or Firestone. Both sets of brakes act on drums secured to the rear wheels. These have a diameter of 14 in. and a width of face of 4½ in. The two sets of bands are located side by side, each band being 2 in. wide. The rear springs are of the three-quarter elliptic type, while the front springs are semi-elliptic. A Jacox steering gear is mounted on the left hand side. The radiator is rounded and is nickel finished.

Among the new features introduced in the special bodies are a hood ventilator on top of the hood instead of the usual side louvres; a specially rounded radiator of the distinctive design; bullet head lamps and tail lamps; wire wheels with cord tires; unusually wide doors; straight body lines, and a ventilator in the cowl. The new chassis on which these bodies are mounted has a wheelbase of 124 in.

The seven-passenger Kissel-Silver Special will be finished in maroon and will have leather upholstery and an olive and drab summer top. Another design of this same car will be finished in gun metal. The four-passenger Kissel-Silver Special has one 36-in. door on each side. It is finished in Silver light blue with tapestry upholstering and an olive and drab summer top. The five-passenger Kissel-Silver Special staggered door body car will be finished in gun metal and will have leather upholstery and an olive and drab semi-victoria summer top.

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Hongkong Develops Car Demand

THE use of automobiles in Hongkong is comparatively limited, but at present there is what might be classed as an automobile boom in the colony. The government is planning a comprehensive system of road building and improvement and, in fact, already has started actual work on roads that will extend the use of the motor car. The wealthier Chinese have taken to motoring enthusiastically and are the best customers of the public garages. The use of cars by private owners generally is on the increase.

The number of cars in use has grown rapidly during the last few months. The colony now has 125 cars and 118 motorcycles, compared with 105 cars and 91 motorcycles in December, 1916. A canvass of the dealers indicates that between twenty-five and thirty new cars have been ordered, all from the United States. Most of them are popular priced, but there is an increasing demand for the higher ones. An order for eleven placed by one garage included five of high grade. In spite of excessive freight rates the demand promises to continue for some time.

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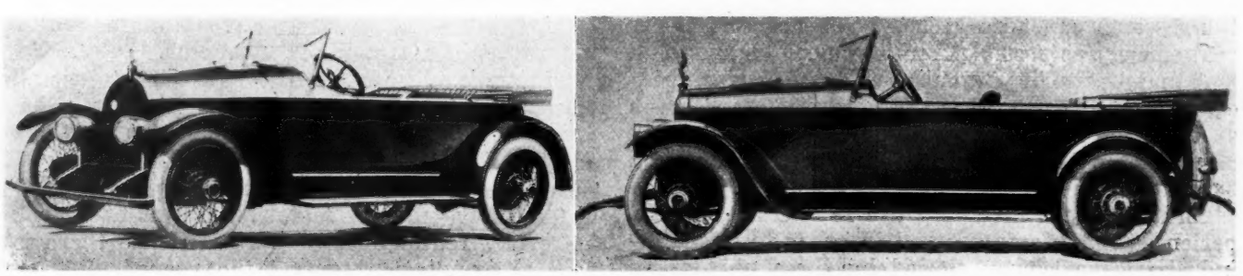
More Farm Tractors in Scotland

THE use of tractors in Scotland on farms has increased remarkably during the last 2 years, and the present demand is far in excess of the supply. High prices and increased cost of upkeep of farm horses, added to the heavier expenses for labor, have compelled the larger farmers to turn to the tractor. A local farmers' association has stated that it would be difficult for any class of farmers other than those cultivating more than 160 acres to make use economically of tractors unless the smaller farmers can combine to use one tractor among several of them. It seems only a question of time until a hiring system will be found which will work conveniently and economically in much the same way as in threshing.

Several American tractors are on the Scottish market, in limited numbers on account of import restrictions, but experience has made the Scottish farmer confident in the American make of farm machinery and doubtless there will be a great demand for American tractors after the war.



C. T. Silver and the Kissel Motor Car Co. together have developed some striking body lines. On the left is the new four-passenger model. The seven-passenger car is on the right

AUTOMOTIVE INDUSTRIES
The Automobile

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Unbalanced Inventories

ONE of the most critical phases of manufacturing under present conditions is the possession of an unbalanced inventory. Unwise purchasing agents, perhaps unduly alarmed by apparent shortages in certain lines, have overloaded themselves with certain materials for production purposes. The result is that there are a number of factories which find themselves in a position of being overstocked on a great many parts, while the building schedules are reduced because they are short on other parts. In these war times everything should be done to maintain a balanced inventory, because this is the only thing which can keep a factory as nearly 100 per cent efficient as possible from a financial standpoint.

A manufacturing organization is inefficient financially when the working capital required is much in excess of its manufacturing budget. The difference between the two is represented by overhead and excess stock inventories to a large extent. The effects of an unbalanced inventory are A B C's to the experienced manufacturer, and in order to offset the industrial inefficiency caused by these unbalanced inventories, he should receive every co-operation all along the line from the government as well as parts makers, to help him back to a balanced condition in order that his cost per unit of output will be at a minimum.

Short-Sighted Economy

THE Michigan fuel administrator is recommending that the industrial plants in Michigan not primarily engaged in munitions manufacture be closed down for the period of 1 week. He is doing this to save fuel.

Down through the coal districts of Pennsylvania and other parts of the country are thousands of acres of fuel lying in the ground, while prosperous mine laborers are reported to be resting during the period expending their previous month's wages.

This condition looks like a paradox and would not seem possible were it not true.

Of course the fuel administrator realizes that when he shuts down the industrial plants for a week he cuts off the pay envelopes of thousands of workmen to whom each week's pay means next week's living. How are these men going to be compensated for their loss of time? Coal production is not up to normal and yet demand is higher than ever, and it is necessary that we economize; but does it seem to be correct economy to close down the industrial shops which mean the livelihood of thousands of men, women and children who must remain in idleness in unheated homes during the period of shut-down?

Alloy Steel in Tractors

UNTIL quite recently cold rolled and machinery steel were considered quite good enough materials for tractor construction. Designers figured that in order to obtain a high drawbar pull they had to have a large amount of weight on the drivers, and this was a direct inducement to the use of material of low tensile strength. Gradually, however, the question of efficiency is coming to the fore. By using suitable driving lugs it is possible to get a certain draft with less weight on the drivers, and by increasing the proportion of weight on the drive wheels to the total weight, further lightening of the tractor is justified. Of the two methods of increasing the limiting draft—that of increasing the weight on the drivers and that of improving the ground-gripping device—the latter is certainly the best, for it takes power to drag weight over the ground, even though the speed may be low. It is thus coming to be recognized that great weight is not an advantage but rather a detriment in a tractor.

Tractor engineers are now beginning to use alloy steels in liberal amounts. It is especially valuable for use in the power transmitting shaft. When a shaft is found to be too weak for the power it has to transmit the easiest solution of the difficulty is to use a better grade of material, as this does not require any redesigning of parts. Hence there is a natural gravitation toward the use of alloy steel for shafting. Nickel and nickel chrome steel, heat

treated, can be safely worked at twice the stress as ordinary cold rolled steel. The smaller shaft diameters permissible with alloy steel entail the use of bearings of smaller diameter, which is a direct saving. Also, when the shaft is inclosed in a housing a slight reduction in diameter leads to a considerable reduction in weight.

While there are thus many good theoretical reasons for the use of alloy steel in tractors, the real reason why it is being substituted for cold rolled and similar material is because these latter gave trouble. Cold rolled steel serves very well for line shafting and for other installations of a stationary character where weight is no object and stresses can be kept down; but in a self-propelling vehicle where stresses must naturally be high, quality steels meet the requirements much better. It will probably not be many years before every tractor shaft, at least from the crankshaft back, will be made of alloy steel.

The Future of the Motorcycle

THERE are several reasons why we may expect the motorcycle industry in this country to receive a great impetus during the next few years. In the first place there is probably no other means of transport that will carry a single person over a given distance at the same low cost as the dependable little two wheeler. Its high fuel economy is bound to prove a factor of increasing importance as the fuel situation becomes more critical. Aside from this the motorcycle affords a chance to save on tires and on general upkeep.

We are now being exhorted from all sides to practice economy, and the chances are that before long circumstances will impose economy on a great many of us. Pleasure riding may be curtailed, but the country's industrial activities will be accelerated, and this means, among other things, an increased need for quick individual transportation.

Heretofore our poor roads have been a handicap to the popularization of the motorcycle. Having practically no spring suspension and only small diameter pneumatic tires, the motorcycle is not well adapted for use on bumpy roads. This statement might be disputed on the ground that a strong, active rider can take a two wheeler over ground that is impossible for an automobile, but it must always be remembered that in the future one of the greatest objects will be the conservation of human energy.

One thing that has kept the motorcycle back in this country is the strong competition it has had from low-priced cars. A first-class motorcycle with side car attachment costs about as much as a low-priced runabout. It is a question whether the runabout or the side car is more comfortable to ride in, but there is no doubt that the runabout makes a stronger psychological appeal to the man who wants a vehicle for other than strictly commercial use.

Would it not be a good plan to take a leaf out of the book of the runabout makers and offer a machine of the simplest possible construction that will give the necessary service, leaving off all unessential equipment and thus widening the price difference? Low cost of operation is certainly a good talking point for the motorcycle salesman, but low first cost is apt to make more of an impression on the average buyer.

What the Show Will Reveal

WITHIN a few days the New York Show will open once more at the Grand Central Palace. It will be the fourth show since the outbreak of the great war, but the first since the United States entered it as an active belligerent, and the conditions under which the industry is working therefore are materially different from those at the time of previous shows.

From an engineering standpoint we are concerned mainly with technical progress and it may be set down at once that the times are not propitious for any radical changes. There certainly will be very few entirely new models, as the rather uncertain future has discouraged experimental work and extensive investment in tool equipment. On the other hand there will be the usual detail improvement in practically every model on exhibition.

Such improvements are partly based upon observations of the service department as to the most prolific causes of trouble, partly upon conclusions drawn by the sales department as to the preferences of the buying public and partly upon ideas of the engineering department found in the course of the year. Such refinements as result from these causes will probably be as numerous as ever before. The features thus introduced in the different chassis generally are new only on that particular chassis.

Whether any distinct new tendencies will make themselves apparent remains to be seen. In recent years such tendencies have mainly related to body design, and it seems that in the direction of smooth-flowing lines the limit has nearly been reached, so that if there is to be further change in body styles there must be at least a partial reversion to previous types.

One tendency that is quite manifest is that toward smaller wheels. Only a few years ago the ground clearance was an important factor, and it was not uncommon for the sod pan to scrape the central ridge on deeply rutted roads. To-day the purchaser seldom inquires about ground clearance, but a low-hung car strikes his fancy. With the increasing speed of engines the smaller wheel simplifies the problems of gear reduction, and, besides, a smaller tire costs less.

The buying public seems to be developing a decided taste for the roadster model with wire wheels, cord tires and body lines that suggest speed and comfort.

It is impossible to say at the present time just what the market conditions in the automobile business will be during the coming year, but one thing certain is that the average buyer will scrutinize the cars offered him more closely than ever before and it therefore behooves every designer to thoroughly study the trends of the time, which are nowhere indicated more clearly than at the New York shows.

□ Latest News of the

Close Co-operation Planned

Different Trades to Have a Committee at the Capital

WASHINGTON, D. C., Dec. 26—The Automobile Industries Committee is now under way and has started a number of plans designed to coordinate the manufacturers of the industry and government departments seeking bids for war work.

The pressed steel plants of the country have formed an association under the style Pressed Steel Service Committee and opened an office in the same building with the Automobile Industries Committee. The office is in charge of H. L. Green, formerly secretary of the Pressed Steel Makers Association, Cleveland. This office co-operates with the Automobile Industries Committee by supplying a list of presses, a survey of the various plants and lists of idle presses so that the Automobile Committee knows where to place a contract with the least disturbance to industry. The makers in the association include:

Acklin Stamping Co.	Toledo
American Tube & Stamping Co.	Bridgeport
Bossert Corp.	Utica, N. Y.
Boston Pressed Steel Metal Co.	Boston
Crosby Co.	Buffalo
Detroit Pressed Steel Co.	Detroit
Gier Pressed Steel Co.	Lansing
Geuder, Paeschke & Frey Co.	Milwaukee
Globe Machine & Stamping Co.	Cleveland
Hale & Kilburn Co.	Philadelphia
Hydraulic Pressed Steel Co.	Cleveland
Ireland & Matthews Mfg. Co.	Detroit
Kales Stamping Co.	Detroit
Frank Mossberg Co.	Attleboro, Mass.
Savage Arms Corp.	Sharon, Pa.
Sharon Steel Hoop Co.	Sharon, Pa.
A. O. Smith Corp.	Milwaukee

It is planned to form similar associations among makers in the forge brass foundry, brass finishing and other industries.

The Automobile Industries Committee has inaugurated a bulletin service and is sending out bulletins to makers informing them of government requirements. Following is a brief outline of the bulletins:

Bulletin No. 1 calls for several million adapters.

Bulletin No. 2 calls for machining capacity for 75 milimetres, 155 milimetres and especially for 4.7 in. shells.

Bulletin No. 3, the last issued, calls for 4500 trailers for overseas shipment to be furnished during February, March and April, 1918. These trailers are for the Signal Corps and contracts are awarded in quantities of 1500, 1000, 750 and 500. The general specifications include two 35 by 5 wood wheels, pneumatic tires, solid axles, tapered roller bearings, 5-in. structural channel frame, length 21 ft., width 49 in., platform yellow pine ⅞-in. thick, 21 ft. by 6 ft. 9 in., half elliptic springs 3 by 54 in., solid channel tongue, 2000 lbs. capacity, no steering device. Bids must be received by 10 a. m., Dec. 31. Master blueprints will be furnished manufacturers receiving contracts.

Further bulletins will be issued as required. The committee publishes drawings of block dimensions where possible, but in the case of blueprints does not publish these but sells them at cost to the makers desirous of securing them. Many of the blueprints, however, are not displayed except to reliable manufacturers considered trustworthy by the committee and the government in order to maintain military secrets.

Following the organization of the big shell company comprised of automobile makers in Detroit, the committee now plans to organize like companies of automobile and parts makers for shell manufacture in Jackson and Cleveland, and possibly in several other cities.

The nine engineers connected with the committee, and previously named in a recent issue of Automotive Industries, are now actively engaged in making surveys and investigation and acting as guides to makers who have secured government contracts through the committee.

The Committee issued a request by mail early in November to many makers and to all included in the National Automobile Chamber of Commerce and the Motor & Accessory Manufacturers Association asking them to specify their capacities and their willingness to take over government war work, and has as yet to hear from more than 150 of the N. A. C. C. members and from over 400 of the M. A. M. A. members, showing that a considerable number are not especially interested in war work. The committee plans other methods for further promoting government work in the plants of the automobile industry and will inaugurate them as speedily as possible.

—

Export Freight Rate Increase

WASHINGTON, Dec. 27—Increases for eastern railroads of from 10 to 15 per cent in rates, following the recent filing of briefs by eastern carriers on which a 15 per cent increase was asked, is expected here at the hands of the Interstate Commerce Commission shortly after the holidays. Should an increase be granted, exceptions are expected to be made on anthracite and certain other commodities, vital at present to the Government and the public.

Single Head for All War Buying

Willard Probably to Be Minister of Munitions with Sole Purchasing Power

WASHINGTON, D. C., Dec. 27—It is generally accepted that within a few weeks the President will have created a Ministry of Munitions which will correspond with a similar organization in England. Under this Ministry of Munitions there will be complete power to purchase the necessary munitions, and such power will be centered in this new office. It is planned that the members of the present War Industries Board will be Lieutenants, so to speak, to the Minister of Munitions, and that in all probability Daniel Willard, now chairman of the War Industries Board, will be given the position of Minister of Munitions.

So far as the automobile industry is concerned, this means that manufacture and purchasing of automotive apparatus for the war will be centered under this organization, and that instead of motor trucks, for example, being purchased and manufactured under the direction of the Signal Corps, the Engineers Corps, Medical Corps, the Ordnance Department, the Quartermaster's Department, or other departments, they will all be centered under the Minister of Munitions. The above-mentioned departments will thus cease to be purchasers of such apparatus, and will be merely distributors of it to the different parts of the war zone where necessary. In other words, the activities of the different Army departments thus become confined to operations in the war zone, and the industrial end of manufacture and purchase is separated from them and turned over to the Ministry of Munitions.

This new order of things indicates that the present War Industries Board has not proven successful in that it has not had power vested in it, but its activities have largely been suggestive. It might be further concluded that the various priority orders and some other means taken to meet the war exigencies have not proven effective.

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Salon to Open New Year's Night

NEW YORK, Dec. 27—The Automobile Salon at Hotel Astor will open New Year's night, instead of the morning of Jan. 2, as previously planned. The earlier opening has been made possible by an arrangement to bring many of the exhibits into the ballroom on Dec. 30.

Automotive Industries

S. A. E. Winter Program Complete

Baker, Cormac and Coffin Speakers—Standards Committee Meets Jan. 9

NEW YORK, Dec. 27—The complete program for the Annual Meeting of the Society of Automotive Engineers to be held at the Engineering Building, 29 West Thirty-ninth Street, New York, on Thursday, Jan. 10, which is the Thursday of automobile show week, has been completed by the 1917 Meetings Committee, and all of the papers and addresses have been under preparation for nearly 2 months. Interest in the meeting is shown by the fact that to date 797 tickets for the Annual Dinner to be held at Hotel Biltmore on Thursday evening, Jan. 10, have been sold. The capacity of the hotel will be exhausted more than a week in advance of the dinner.

The complete program for Thursday afternoon, Jan. 10, follows:

1. "The Reasons Behind the Liberty Engine," address by Major J. G. Vincent, followed by special discussion by Col. Clark, Capt. Howard Marmon, and H. M. Crane of the Wright-Martin Co.
2. "The Reasons Behind the War Truck." This will be handled by five different men, one handling the engine, another the transmission, another the general chassis, a fourth the axles, and a fifth the engine tests. These are: Engines. A. F. Milbrath; Transmission, A. W. Copland; Axle Design, G. W. Carlson; General Chassis, C. T. Myers; Engine Tests, Capt. W. M. Britton.
3. "Fuels for Automotive Apparatus," by Dr. E. W. Dean.
4. In addition there will be several papers which will be printed for circulation among the members.

The Annual Dinner at Hotel Biltmore on the evening of Thursday, Jan. 10, will be entirely military in its character. The following speakers will be present: General Chauncy B. Baker of the Quartermaster's Department in charge of transportation, and who has been the moving spirit back of the standardized war trucks. Dr. J. D. Cormac of the British Mission on Aeronautics, who has been in this country for several months, will represent aviation interests on the program. Howard E. Coffin, chairman of the Aircraft Production Board, and John Kendrick Bangs, the latter acting as toastmaster, complete the array of speaking talent.

The annual business meeting of the society will be held on the morning of Thursday, Jan. 10, in the Engineering Building, and reports from all committees, as well as from the secretary and treasurer, will be presented. The election of officers for 1918 will take place and general business will be transacted. The professional program outlined above will be held in the afternoon. There will be in addition the usual meetings of the divisions of the Standards Committee.

The entire Standards Committee will meet at 10 a. m. Wednesday, Jan. 9, when reports from all the divisions of the committee will be made. During the past year a few of these divisions of the Standards Committee have been especially active on Government work. Some of these are: Aeronautical division, Military Truck division, Motorcycle division, Farm Tractor division, Miscellaneous division and the Tire and Rim division. The number of committees reporting will not be so great as in former years, but the amount of work accomplished will prove greater than in previous years.

The complete report of the Standards Committee, as adopted at this meeting, will be brought before the society at its forenoon meeting on Thursday, Jan. 10.

As a preliminary to the Standards Meeting of Jan. 9, there will be several meetings of divisions. The Miscellaneous division will meet at 10 a. m. Monday, Jan. 7. The Tractor division will meet at 10 a. m. Tuesday, Jan. 8. The Electric Vehicle division will meet at 10 a. m. Monday, Jan. 27.

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Better Railroad Service Under Federal Control

Government Operation Will Facilitate Pooling and Simplify Terminal Problems

NEW YORK CITY, Dec. 27—The taking over of the railroads by the government should result in greater unification of the different railroad systems and a vastly improved service without any increase in rolling stock.

This is the opinion of J. B. Marvin, traffic manager of the N. A. C. C., on the recent action by President Wilson. Under present conditions it has been impossible to procure the most desirable pooling of different railroad lines because of its conflict with the Sherman law. Now it is possible to accomplish any pooling that the railroad war board or the director of railroads, Secretary McAdoo, may desire.

Mr. Marvin reports that several automobile dealers have recently been guilty of considerable delays in unloading freight cars consigned to them, and that these delays have been the worst stumbling block that his organization has had to deal with in presenting the case of

(*Continued on page* 1164)

Labor Situation Not Alarming

No Shortage of Skilled Workers at Present—Fear Felt for Future

DETROIT, Dec. 24—The labor situation is adjusting itself rapidly to the new conditions, and though at present there is no shortage of skilled labor generally, fear is expressed for the future. Passenger production has decreased slightly, war business has but started, mechanics from outside have been attracted by high wages, and have temporarily relieved the situation.

On this question the Ford Motor Co. states that it is not hiring any amount of men, and hence is not yet affected. The turnover is slight but it is realized that if a large number of men were desired great difficulty would be experienced and the men would have to be taken away from machines in other plants. It is this that is to be feared, for when the war business is well under way, the skilled men will sell themselves to the highest bidder, and no employer will be certain of his men from one day to the next.

The Packard Motor Co., which is already engaged on large war contracts, states that it could use many more skilled men, but that the number of unskilled men available — particularly aliens—is large. This plant is using women in some of its departments, such as top building, upholstering and inspection.

The employment office of the Timken Detroit Axle Co. claims that the labor situation is easier than it was 6 months ago. However, they cannot get certain specialized experts to-day. These are the toolmakers, die sinkers, and men that do skilled individual work, and not production. It is these men that are in demand to tool up the various factories for the coming production, and as the factories are to-day going through that process, the demand for such men is great.

Efficiency men, time-study men, etc., are also scarce—that is, real experienced men. These are also needed in placing material in production and have been quickly taken up.

This in brief sums up the opinions of the labor superintendents of the various factories. The men that have had experience are all taken and are getting better pay than ever before, $10 to $12 per day. To date it is these men that the factories have desired to put on immediate production.

Commissions for Mechanics

Examinations for Lieutenants in Signal Corps Regiment Arranged by Officers

NEW YORK, Dec. 23—Examination of automobile mechanics for lieutenants' commissions in the Motor Mechanics Regiment of the Signal Corps for service abroad will be held at the offices of the Packard Motor Car Co., Sixty-first Street and Broadway, on Jan. 11, 12 and 13. There will be two sessions each day, from 1.30 to 5.30 p. m., and from 7 to 10.30 p. m., under the direction of a board of army officers. There is urgent need for motor vehicle foremen who are all-around mechanics, qualified to do motor vehicle work and to direct and organize men in that branch of the service. Experienced foremen over the draft age are preferred, although the most desirable age cited by the examiners is from 28 to 35 years. Applicants are requested to bring three letters of recommendation, and a letter from the present employer, giving details of the work done, and the salary received. Applicants must be American-born or naturalized citizens. Men under 28 years will probably not receive commissions, but those over that age who are accepted will be made lieutenants at once. Similar examinations will be held in Detroit to-morrow. They will also be held in Indianapolis, Detroit, Toledo, Cleveland, Boston and Philadelphia this month and the first two weeks in January.

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Standard Four Tire Co. Expands

KEOKUK, IOWA, Dec. 22—The Standard Four Tire Co. has set aside the yearly interest of 8 per cent on preferred stock and declared a dividend of 20 per cent on common stock. The capitalization of the company has been increased from $200,000 to $4,150,000, of which $3,500,000 will be preferred stock and $650,000 common stock. A new plant will be erected immediately.

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Combined Motors Narrowed

CHICAGO, Dec. 22—The Combined Motors Corp., which, according to earlier reports, was to be a merger of three car manufacturing companies and a body building company, will combine only the Bour-Davis Motor Car Co. and Shadwick Bros. Co., Detroit. Neither the Dixie Motor Car Co., Louisville, nor the Collins Body Co., St. Louis, both originally reported in the combination, has been included.

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Ohio Improves 342 Miles of Roads

COLUMBUS, OHIO, Dec. 22—According to a report made the State Highway Department contracts for 249.6 miles of roadway were let this year. The divisions as to type were: Plain concrete, 15.97 miles; reinforced concrete 11.92; water-bound macadam, 90.12; bituminous macadam, 69.34; surface treated macadam, 3.77; brick, 45.49; roadbed and roadway only, 12.98; miles of road completed, 342.2 miles. This is an increase of 62 per cent over the previous year, despite the hindrances of an unfavorable spring for contract work. There were repaired 1,034.23 miles, and there is now a total of 1,468.31 miles of State roads.

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Hawkeye and Beck Merged

CEDAR RAPIDS, Dec. 22—The Hawkeye Carriage Co. and Beck & Son, Cedar Rapids, have been consolidated under the style Beck-Hawkeye Motor Truck Works. A stock company with a capital of $150,000 has been formed, of which Martin P. Beck is president, D. A. Stoflet, secretary, and G. C. Schneider, treasurer.

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Missouri Bans Spotlights

ST. LOUIS, Dec. 24—Spotlights, except on country roads, and cut-outs are prohibited in Missouri next year. Headlights must have a moderate intensity, and placed low. License plates must be carried front and back, and chauffeurs, other than car owners, must wear numbered badges, costing $1.50. The rules have been issued by Secretary of State Sullivan, and are part of the law which goes into effect Feb. 1.

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Jones Co. Adds Trucks

WICHITA, KAN., Dec. 22—The Jones Motor Car Co. has added two models of trucks and will manufacture 2000 during 1918. A 1-ton model, to sell at $1,100, will be ready for delivery Feb. 10, and a 2-ton model will be on the market by March 1. The Model N Continental Motor will be used.

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Pan-American Takes Lumb

CHICAGO, Dec. 21—The Lumb Motor Truck & Tractor Co., Aurora, Ill., has been taken over by the Pan-American Motors Corp., Chicago. The truck manufactured by the company will be styled Pan-American.

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Truck Train at Ligonier, Pa.

LIGONIER, PA., Dec. 23—The train of thirty United States army trucks of the Packard 3-ton type reached Ligonier this evening, after a run of 47 miles from Pittsburgh. The train will reach Bedford, Pa., by to-morrow evening, where it will spend Christmas.

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Charles J. Klein Dies

MILWAUKEE, Dec. 22—Charles J. Klein, designing engineer of the Cutler-Hammer Mfg. Co., died last Monday, at the age of 55 years. He came to the Detroit office of the Cutler-Hammer Co. in 1908 from its New York plant. Klein invented many of the electric controlling devices manufactured by the company, and perfected the C. H. magnetic gearshift.

Truck Makers to Solve Problems

Will Meet Jan. 8 in New York to Fit Industry to War Conditions

NEW YORK, Dec. 24—Manufacturers of motor trucks will meet in this city Jan. 8, during the New York show, to consider how the motor truck industry may best fit them into war conditions.

One of the big subjects to come up will be the greater use of trucks, in short haul work—10, 20 and 30 miles—in order to relieve the railroads of their freight overload. Experts have stated that the use of trucks in this manner would do much toward ameliorating conditions.

The truck men will also consider how they can be of greatest service in co-operating with the Government in this motor truck program. The demands made upon the industry will be explained fully.

The meeting will be held in the board room of the National Automobile Chamber of Commerce, which is calling the meeting. Among the papers scheduled are:

Co-operative Delivery with Motor Wagons; A. W. Shaw, chairman of the Commercial Economy Board of the Council of National Defense.

Motor Trucks in Short Haul Work; George H. Pride, president of the Heavy Haulage Co., New York.

Delivering Army Trucks by Highway; Brigadier General Chauncey B. Baker of the Quartermaster's Department, U. S. A.

Work of the Highways Transport Committee; Roy D. Chapin, chairman.

Highways for Heavy Haulage; Henry G. Shirley, chief engineer of the Maryland State Road Commission, Baltimore.

Legislation Affecting the Use of Motor Trucks; J. T. Roche, vice-president of the Locomobile Co. of America.

Maintaining a Record of Unselfish Co-operation; George M. Graham, manager of the truck department of the Pierce-Arrow Motor Car Co.

Others invited to attend include H. L. Horning, chairman of the Automotive Products Section of the War Industries Board; Christian Girl, director of production, Military Truck Division, Quartermaster's Corps, U. S. A.; Alexander W. Copland, Hugh Chalmers and J. R. Lee of the Automotive Industries Committee, and Logan Waller Page, director of the Office of Public Roads, Department of Agriculture.

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Co-operate on Government Work

JACKSON, MICH., Dec. 22—Manufacturers of this city are adapting a plan for handling government work under a co-operative system. Each manufacturer joining the movement pays a fee of $50, the total sum to be used to hire a competent engineer who will make a survey of the factories and represent the manufacturers in the capital. Factories receiv-

ing contracts will be required to pay a pro rata tax to cover the expense involved. The companies backing the movement follow: Sparks Withington, Perlman Rim Corp., Alloy Steel Spring & Axle Co., Jackson Automobile Co., Briscoe Motor Corp., Frost Gear & Forge, Hayes Wheel Co., Mott Wheel Works, Jackson Cushion Spring Co., Frost Machine Co., Jackson Carbureter Co., Jackson Metal Products Co., Lockwood-Ash Motor Co.

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Navy Air Service Wants Motor Experts

WASHINGTON, Dec. 24—Men with practical experience in constructing and repairing automobile engines are in demand for ground service in the Navy Flying Corps. An excellent opportunity is offered at the present time in order that the talents of men expert in this work may be utilized in preparing and maintaining sea planes.

After instruction enlisted men are eligible for appointment as first and second class petty officers in the Naval Flying Corps. On the basis of ten men to every flyer, about 8000 mechanicians will be necessary to complete the organization of the corps.

Enlistment as a mechanic in the Naval Flying Corps now stationed at Great Lakes, Ill., is by application to Lieut. Lee Hammond, U. S. N. Training Station, Great Lakes, Ill.

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To Make Texan Car at $850

DALLAS, Dec. 22—Organization of the Texas Motor Car Association with a capital of $1,000,000 and a proposed capital of $2,000,000, for the purpose of manufacturing the Texan, a new product of the automobile world, has been completed. A factory location will be selected within the next few days and within the next few weeks work on this factory will begin. Within the next three months it is proposed to have the factory in operation. The factory is to build and put in operation twenty cars daily or 6000 cars per year. The car will sell for approximately $850. It will be a two- and five-passenger car. Within a few months after operation is begun the company proposes to build trucks and tractors. Details for these plans are yet to be worked out.

Construction work will begin within thirty days at Fort Worth. At the start, the company will employ 500 men and manufacture 20 cars daily.

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Government Assembly Plant Near Baltimore

BALTIMORE, Dec. 24—The Bureau of Appliances and Equipment of the United States Government has purchased 91 acres of land, near St. Helena, about six miles from here and will at once erect an assembling plant for motor trucks for use of the Federal Government. The tract is located close to both the Pennsylvania and the Baltimore & Ohio tracks and is adjacent to water routes. The price was $91,000. Details of the construction of the plant have not been announced as yet.

Cleveland S. A. E. Meets

Schipper Talks on War's Effect on Designs—Discusses Convertible Bodies

CLEVELAND, Dec. 22—At the meeting of the Cleveland section, Society of Automotive Engineers, held at Hotel Winton last night, J. Edward Schipper, technical editor of AUTOMOTIVE INDUSTRIES, talked on the Effect of the War on Automobile Design. His papers were lost previous to the meeting, but his talk covered the same ground.

Convertible bodies held the attention of the meeting, members arguing as to the relative advantages of the fixed and removable-pillar types. The consensus of opinion was that the fixed-pillar will be the dominant type.

There was no disagreement with the speaker's assertions that car weight per passenger in this country is too high. It was also conceded that the performance desired by the American user could be had from an engine of 200 cubic inches piston displacement with a car weight of 3 lb. per pound of passenger weight.

In closing the meeting Mr. Schipper brought up the question of kerosene as a non-freeze agent in order to get the opinions of the members on this subject. He pointed out that if $2 in alcohol could be saved to each car user in the winter belt, there would be a total saving of $2,000,000. Factories are using kerosene in their test cars on pump-cooled cars and thermo-syphon cars with tubular radiators. He believes that the pressure head on a thermo-syphon system is so low that it may not be advisable to try it with a thermo-syphon system having a cellular radiator, on account of the high viscosity of the kerosene which would give considerable resistance when it is forced through the radiator. It was also pointed out that the systems must be kept full, that kerosene must not be used in temperatures more than 20 degrees above zero and that the temperature-registering devices used on radiator caps do not work satisfactorily with it.

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More Room for Service

WABASH, IND., Dec. 22—The Service Motor Truck Co. will put up two additional buildings. The new buildings are to facilitate work on government contracts which the company has.

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Dixie Advances Prices

LOUISVILLE, Dec. 22—The Dixie Motor Car Co. has advanced its prices effective Dec. 19. New prices are: Touring and roadster $995; sedan $1,375.

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Trucks Coming From Sioux City

SIOUX CITY, Dec. 22—The Hawkeye Truck Co. has been formed here with $300,000 capital to take over the business of the Hawkeye Mfg. Co. The company will manufacture trucks. Officers and stockholders in the company are: President, R. W. Bennett; vice-president, F. W. Kemp; treasurer, A. T. Bennett; secretary, L. D. Baggs.

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Parts Concerns Merge

CLEVELAND, Dec. 17—The Bowen Mfg Co., Auburn, N. Y., Zerk Mfg. Co., Cleveland Wiskley Co., Detroit, and the Canadian Wiskley Co., Windsor, Ont., have been consolidated and will be styled Bowen Products Corp., Auburn, N. Y. The combined capital will be $2,500,000. The merged plants manufacture parts, but at present are engaged chiefly on motor truck work for the government.

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Curtiss October Shipments $2,800,000

BUFFALO, Dec. 24—Shipments of the Curtiss Aeroplane & Motor Corp. totaled approximately $2,800,000 in October, and about the same in November. Orders now on the books are sufficient to keep every plant running to full capacity up to Oct. 31, 1918. The company has practically completed arrangements with the Government for taking care of its financial program during the war. The Government has agreed to advance to the corporation all the funds it may require for a working capital.

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2-Ton Paige Truck Coming

DETROIT, Dec. 24—The Paige Motor Car Co. has taken over part of the plant of the Williams pickle factory. This is to be used for manufacturing a new motor truck developed by the Paige company. Immediate steps are being taken to place the truck in production. It is a 2-ton truck and it will be some time before it is placed on the market.

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Three More Empire Directors

TRENTON, N. J., Dec. 24—John E. Frazer, mechanical engineer, New York; W. W. Saunders, chemical expert, Akron, and C. Edward Murray, Jr., factory superintendent, have been added to the board of directors of the Empire Tire & Rubber Co., Trenton.

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Naval Aircraft Factory Completed

WASHINGTON, Dec. 21—The $1,000,000 naval aircraft factory at the Philadelphia Navy Yard has been completed, and 2000 skilled workers are needed immediately to put the plant in operation.

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Sewell Expects Banner Year

DETROIT, Dec. 24 — The Sewell Cushion Wheel Co. recently held a sales representative convention to discuss sales plans for the coming year. It is expected that the sales for 1917 will exceed $750,000, those of 1916 totalling $310,000.

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Detroit Show Space All Gone

DETROIT, Dec. 24—Practically all the space of the seventeenth annual automobile show is now taken. There will be about 79 exhibitors in all, including passenger cars, trucks and accessories. The show is to be held in the Overland building, opening Jan. 19.

Cries "Muddle" at War Truck Program

Washington Post Sees Great Inefficiency and Cause for Grave Alarm—Urges "Executive Engineer"—Blames "Standardization"

WASHINGTON, D, C., Dec. 26—The *Washington Post* in to-day's issue calls attention to a so-called "muddle" in the war truck program of the various war departments. It states there is less co-ordination and co-operation in Washington than it supposed and that it is a discouraging fact that the various bureaus in the war department are working at cross purposes.

These views are based on the fact that the Quartermaster's Department has developed three types of standardized war trucks, namely, Class B, a heavy-duty truck; Class A, a medium-duty truck, and Class AA, a light-duty truck which, however, is supposed to represent the embodiment of co-ordination among the different departments of the Government in that it is suitable for the Quartermaster's Department, Signal Corps work, Medical Corps work, Ordnance, Engineers' Corps, etc. The Signal Corps has, however, developed its own type of light high speed truck with pneumatic tires. It is a fact that the Engineers' Corps has been purchasing trucks on its own initiative and that the Medical Department has been acting similarly.

"It has been supposed," says the *Post*, for example, "that the war department had adopted standardized parts of motor trucks for war use. It appears that this is not the case; that standardized trucks have been adopted—by each bureau.

Quartermaster Has Three Sizes

"The Quartermaster Department, the first to begin the organization of a truck supply bureau, has adopted three sizes. It has been supplying trucks also to some of the other bureaus, all of which, however, are going ahead in their own way to obtain their own 'standardized' truck. Incidentally, the Quartermaster Department has evolved what it calls the Liberty truck motor, the manufacture of which has necessitated the making of new jigs and lathes and machinery. Existing types, apparently, were unsatisfactory. This has caused a great delay and might have been avoided. The entire available manufacturing abilities of the country are not being utilized.

"The War Department branches using large numbers of trucks are the Quartermaster Department, Medical Corps, with two sub-branches Sanitary and Ambulance, Ordnance Department, Signal Corps and Field Artillery.

"Each of these is getting its own trucks and equipment with regard neither to co-ordination or co-operation but with quantity production apparently the only thing in mind. The Medical Corps, for instance, is not adopting the Liberty truck but is trying various kinds of standard trucks, 6 or 8 in number, each requiring different parts.

"Grave alarm is now being felt in well-informed circles as to what will happen when all these different 'standardized' trucks, that are not standardized, get to France, where a situation of utmost confusion is certain to prevail. Instead of standardized repair shops for the repair of all automobiles and the replacement of standardized parts, the lack of standardization will make necessary the maintenance of repair plants by each War Department branch.

"It is easily conceivable that if the present situation is permitted to continue a Medical Corps truck might break down somewhere in France, right in front of the repair plant of the Ordnance Bureau and be unable to obtain a spare part to replace the broken part.

"Since it is estimated that the United States will invest not less than $125,000,000 in motor trucks, some idea of the magnitude of this matter may be obtained.

"One single base repairshop in France is 80 ft. by 200 ft. It is a stockroom for only three of the 60 units for one department, the Quartermaster's Department. This one building will contain 30,000 stock bins for the storage of automobile parts which should visualize the necessity for standardization. And an army of mechanics will be required so great that the government itself has not been able to find out how many it will need.

"The government is using the standardization of materials and not of design. Most of the bureaus are using the same type, but the various parts of the different trucks of the same type are not interchangeable with respect to size.

"There is a quiet movement on foot in the automobile world, where the gravity of this situation is appreciated, to bring the government automobile truck service under one head. What is needed is an executive engineer for the standardization of all motor trucks. Their importance in war could not be exaggerated. Meanwhile it is claimed that all this is being done, whereas according to the technical expert, it is not being done.

"All the various bureaus are starting their own expeditions to France, each independent of the other and, if permitted each department doubtless would insist upon having its own private railroads in France, each with its own stock of engineers.

Priority!

"Not long ago the government established a great new shipyard; a large number of ships were to be built. One official was charged with the duty of obtaining anchors for these ships when they should be completed. He threw himself into the work with all the zeal of a man who felt the winning of the war depended upon him. He scoured the country for anchors; he found them in the most unexpected places and had them built by people who never saw an anchor before. He bought the material and did a fine job of work. When the anchors were ready, he issued priority orders right and left. Coal was sidetracked while these anchors were rushed to the seaboard. Munitions were held up while the right of way was given to those anchors, each moving under a blue envelope. The anchors were delivered in remarkable time. They are on the shipyard sites now waiting for the ships, although according to the last report, the shipyard itself had not yet been started. Those anchors have actually held up the very timber that was to be used in the construction of the yard."
—*Washington Post.*

Bids to Be Opened

The Bureau of Supplies and Accounts of the Navy Department, Washington, D. C., desires sealed proposals under schedule number 2613½ for delivery f.o.b. works for 25 gasoline motor trucks. Bids opened Jan. 7. Further information can be secured by addressing the Department of Supplies and Accounts, Navy Department, Washington, D. C.

The Department of Commerce has received a request from a Mexican concern for a number of agricultural tractors. Quotations should be made f.o.b. factory for Mexican border. Payment will be made by cash against delivery of shipping documents in United States currency. Correspondence may be in English. Address Department of Commerce, and refer to No. 25583, Bureau of Foreign and Domestic Commerce.

The Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C., has received a request from Brazil for an agency for low-priced automobiles and accessories. Quotations should be made f.o.b. New York. Payment will be made in cash against shipping document. Refer to No. 25627.

The Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C., has received a request from Switzerland for the purchase of motor cars and trucks. Payment will be made by cash against shipping document in New York or confirmed credit with New York bank. Correspondence may be in English or French. Refer to No. 25641.

The Bureau of Supplies and Accounts of the Navy Department desires bids for 225 storage batteries for ignition. Schedule No. 2581½. No date is given for opening bids.

The office of the General Purchasing Officer of the Panama Canal desires sealed bids for 6 solid rubber front tires, 20 solid rubber tires, 36 solid rubber tires, 4 tires with inner tubes and 4 single demountable truck tires. For further information address A. L. Flint, General Purchasing Agent, Washington, D. C.

Favor Light Tractors in Scotland

Tractor Weights Too Great—Carbureters Not Satisfactory —$1500 Best Price

EDINBURGH, SCOTLAND, Dec. 11—The special report of the seven official observers in connection with the series of three tractor demonstrations held in Scotland in the month of October has been issued, and contains many important conclusions with regard to the present design of tractors. The trials which were held under Government auspices were intended to take the form of a demonstration rather than a competitive trial and the report is based on the conclusions of the committee from that viewpoint.

According to the committee, the weight of a tractor should not be more than 3360 lbs. and not more than 20 hp. is necessary.

As a variety of the tractors were of the creeper type and others of the wheel type the committee reported that the creeper type was not shown to possess any advantages in gripping power over the best type of wheels used. The report covers a great many points of interest, including the view that the price should not exceed $1,500 for a farm tractor. Speeds should be 2.5 to 4 m.p.h. There should be brakes fitted to all machines.

Accessibility Much Needed

One of the conclusions is that all working parts should be readily accessible but have complete protection against weather. In this connection the report states that exposed gear drives on many tractors result in excessive wear, and that the excessive wear on creeper types tends to impair their durability.

Due to the fact that tractors contact with stones anchored firmly in the ground, the committee concludes that some form of spring attachment between the tractor and the plow is desirable, with the addition of a release device to act in case of severe shocks. The committee believes that the point of attachment should be variable vertically as well as horizontally.

With regard to the handling of tractors in the field the committee concluded that it is not usually difficult, but adds that until machines have the advantage that the implement operates directly under the observation of the driver; and further, that lighter tractors and single unit machines occupy less time and space in turning. The following extracts are taken from the report:

The conclusions of the committee with regard to weight are particularly explicit, the committee stating that it was clearly shown at the demonstrations that light machines adequately provided with spuds on the wheels gripped the ground and performed the work better than the heavier machines. Every drawback, such as slipping on soft land, and inability to climb gradients was aggravated by increase of weight above a certain limit. The committee reported that the extra weight increased the risk of breakages where stones are encountered and that the danger of injury to the land through compression was very noticeable during the demonstrations when the driving wheel on the land traveled within a few inches of the previous furrough. Besides this a heavy tractor is a distinct disadvantage for the other and lighter forms of cultivation, such as grubbing, cultivating, seeding and harrowing, and also for harvesting, especially when the land is sewn with grass seed.

The light tractor is quite suitable, not only for plowing, but for these other farm operations, and therefore embraces all of the usual requirements of a farm tractor, including the driving of a threshing machine and other machinery.

From this the committee concluded that field work and road work are more or less imcompatible and that a large tractor such as is suitable for land work is not so useful for road haulage. In addition for road work the tractor should be sprung to minimize vibration, while for field work springs are undesirable and only entail extra weight.

The committee regretted that it was not possible to carry out the original fuel ideas owing to the difficulty of keeping correct record of the fuel used. According to the conclusions of the committee many of the carbureters were not capable of thoroughly vaporizing the kerosene, and consequently the combustion in many cases was defective and the haulage power of the tractors seriously impaired. It may be found when normal conditions return more satisfactory to use gasoline than kerosene, as being the more efficient, even though the price be somewhat higher. The complete report of the committee will be published in a later issue.

252 Accessory Firms on Show List

25 More Than 1916—10 for Both Shows—19 for New York —5 for Chicago

NEW YORK, Dec. 24—Thirty-four accessory manufacturers have been added to the list of exhibitors for the National shows. This brings the total number to 252 as compared with 227 for the 1917 show. The new exhibitors are:

Chicago and New York

Arrow-Grip Mfg. Co.	Glen Falls, N. Y.
Black & Decker Mfg. Co.	Baltimore
Challoner Co.	Oshkosh, Wis.
Guarantee Liquid Measure Co.	Pittsburgh
Macbeth-Evans Glass Co.	Pittsburgh
Menominee Elec. Products, Inc.	New York
Pratt Mfg. Co.	Chicago
Sunderman Corp.	Newburgh
Water Gas Carburetor Co.	New York
Wire Wheel Corp. of America	Buffalo

New York Only

Adams & Elting Co.	Chicago
Art Metal Works	Newark, N. J.
Auto Pedal Pump Sales Corp.	New York
Edward G. Budd Mfg. Co.	Philadelphia
Carburetor Mantle Co.	New York
Coffield Tire Protector Co.	New York
Eisemann Magneto Co.	Brooklyn
Fryer-Auster Co.	New York
Kales Stamping Co.	Detroit
George W. LeCompte Co.	New York
Otis Elevator Co.	New York
Peters & Herron Dash Co.	Columbus
Philadelphia Storage Battery Co.	Philadelphia
Rives Never-Slip Auto Pedal Co.	New York
Simmons Mfg. Co.	Cleveland
Sales Service Co.	New York
Titeflex Metal Hose Corp.	New York
Tri-ton Trailer Corp.	New York
Union Truck Mfg. Co.	New York

Chicago Only

Air Device Co.	Chicago
Gibraltar Jack Co.	New York
Globe Mfg. Co.	Battle Creek
McKinnon Dash Co.	Buffalo
Syracuse Universal Mfg. Co.	Syracuse

Work on Planes Progressing Well

WASHINGTON, D. C., Dec. 22—Howard E. Coffin, chairman of the Aircraft Production Board, following a trip of inspection, returned here extremely optimistic as regards airplane conditions. He said:

"The material conditions in airplane development are satisfactory; we now want the men to come as fast as the machines.

"Every effort is being made to coordinate effort in aviation work with our allies and to reach standard types of design in the machines.

"There will unquestionably be machines built in a reasonable length of time capable of flying across the Atlantic."

Mr. Coffin stated that the many reports about defects in the Liberty engine are entirely without foundation, that the motor had met every requirement in speed and altitude efficiency under actual tests, and that the motor would stand up against those being used by allied nations and he pointed out for proof, as AUTOMOTIVE INDUSTRIES did in last week's issue, the fact that allied nations have already placed orders for the American engines.

He spoke also of the flying schools he recently visited and characterized them as "most inspiring sights."

"This branch of the service," he said, "is getting the highest type of Americans. Their examinations and the character of the training insures that. While there must be ample for the present demand there must also be more for the future."

"In this connection," he said, "young men should consider that a knowledge of engineering, mechanics or actual flying in connection with aeronautics will have a decided peace-time value. We may beat up cannon into plowshares to paraphrase an old quotation, but the airplane is here to stay and I predict its commercial development after the war will be surprising."

Italian Shipments Doubled

5386 Motor Vehicles Exported in 7 Months—Only 84 Imported

NEW YORK, Dec. 23—According to official figures issued by the Italian Ministry of Finance, the Italian motorcar factories exported 5386 motor vehicles (of which 4977 were lorries and 409 touring cars) during the first seven months of the year 1917. The total value of these machines was 80,515,805 liras. During the same period Italy imported a total of only 84 automobiles, of which 72 were cars and 10 lorries, the value of these being 632,000 francs. Compared with the corresponding period of 1916 Italian exports have more than doubled, while imports are only two-sevenths of those last year. The detailed figures are given below.

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Auto Wheel Earns 20 Per Cent

LANSING, MICH., Dec. 24—The Auto Wheel Co. report for the year ending Oct. 10, 1917, shows earnings of approximately 20 per cent on its outstanding capital of $300,000. The balance sheet shows total assets of $562,696.78. Current assets were $348,832, comprising $19,079 in cash, $90,579 in accounts receivable and $239,174 in inventories. The current liabilities were $189,349, including bills payable, $116,980; accounts payable, $65,828; the accrued wages, $6,540, and net working capital was $159,482. The capital liabilities include authorized capital stock of $500,000, of which $300,000 is issued, and a surplus of $73,346, of which $60,000 was distributed in the form of a 20 per cent dividend in stock. The company has been operating until recently at nearly its capacity of 400 sets of automobile wheels daily. Recently a large Government order was received.

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Detroit Section S. A. E. Hears About War

DETROIT, Dec. 21—Instead of the usual manufacturers' banquet, the Detroit Section of the Society of Automotive Engineers this year held a war smoker for the purpose of conserving the food supply. About 400 members and guests were present and C. E. Frazer Clark, recently returned from France, told of his experiences while serving on the French front with the American Ambulance Field Service. Clark served eight months in the field, seeing action at Hill 304, Verdun, Dead Man's Hill and Argonne Fort. He explained in detail the caliber of the various French guns, their different ranges and why the guns were used in the various offensives. He emphasized the necessity of airplanes in carrying on an offensive, and the importance of observation balloons. The next meeting of this society will be held in February but the exact date has not been specified. J. Edward Schipper, technical editor of AUTOMOTIVE INDUSTRIES, is to be the speaker.

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Help Employees Answer Draft Questions

DETROIT, Dec. 22—A meeting of about 150 factory employment bureau men was held to-night in the Board of Commerce Building to form an organization for aiding employees in answering the draft questionnaire, and handling any matters that may arise in relation to the draft. This will become a permanent organization for the duration of the war, and will handle all such matters as may arise in the future.

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May Advance Federal Truck

DETROIT, Dec. 24—A meeting of the dealers of the Federal Motor Truck Co. was held last week and it is expected that the price of Federal trucks will advance about Jan. 1. These new prices have not as yet been definitely determined but a material increase is expected.

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Mexico Values Its Export Oil

MEXICO CITY, Dec. 22—The Mexican Government has placed specific values on various grades of oil for export. These are based upon market values. The rate of taxation is 10 per cent of the assessed value, which follows:

Combustible petroleum, density of 0.91, $10.50 ton.

Crude petroleum, density of 0.91, $13.50 ton.

Petroleum, density greater than 0.91, $5.50 ton.

Gas oil, $10.50 ton.

Refined gasoline, bulk or packages, 0.12 liter.

Crude gasoline, bulk or packages, 0.11¼ liter.

Crude or refined kerosene, bulk or packages, 0.03 liter.

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Champion Convention Last Week

TOLEDO, Dec. 22—The Champion Spark Plug Co. held its semi-annual convention for salesmen and accessory jobbers last week. The sales campaign for 1918 was outlined and several well-known speakers addressed the convention. About eighty salesmen and jobbers attended.

Manganese Output Quadrupled

70,225 Tons of Ore Shipped by 88 Operators in Seven Months

WASHINGTON, Dec. 23 — Seventy thousand two hundred twenty-five tons of manganese ore were shipped by 88 operators during the first 9 months of 1917, as compared with shipments of 26,996 tons by 55 operators during all of 1916. Present indications are that shipments for the year will be about 112,275 tons, nearly four times the amount of any preceding year. In September the production of high-grade ore was 14,000 tons, and in November it was almost 17,000 tons.

It is probable that shipments in 1918 will be between 175,000 and 200,000 tons, sufficient to supply approximately one-third of the steel industry. For every 20,000 tons that can be produced in excess of the present domestic output, it will be possible to release one ship that is now bringing ore from Brazil.

Of manganiferous ores containing 15 to 40 per cent of manganese, 380,169 tons were shipped during the first 9 months of 1917 by 58 operators, against 176,130 tons shipped by 41 operators in the entire year of 1916. Most of the ore was used to make spiegeleisen. Of ores containing 5 to 15 per cent of manganese, 424,438 tons were shipped by 14 operators during the first 9 months of 1917, against 372,673 tons shipped by 26 operators during the year 1916.

These figures were gathered by the United States Geological Survey, which has been prompted by the importance of the domestic output of manganese ore to collect statistics of production every 3 months.

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Canada Wants Winter Tops

MONTREAL, Dec. 24 — Detachable tops for motor cars are meeting with an unprecedented demand, and for the first time are being received and shipped in carload lots.

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A Car to Three Families in Ohio

COLUMBUS, Dec. 24—There is now one motor car in Ohio for every three families. More than 350,000 licenses were issued in 1917, as compared with 254,000 in 1916 and 187,000 in 1915. Of the total registration 342,000 were for gasoline cars, 4500 electrics and 3500 for dealers and manufacturers. License receipts were $1,765,000 as compared with $1,286,500 last year.

ITALIAN EXPORTS AND IMPORTS FOR FIRST SEVEN MONTHS OF 1917

AUTOMOBILE EXPORTS FROM ITALY
(7 months ending July 31)

Year	Lorries	Value in Liras	Cars	Value in Liras	Total	Value in Liras
1915.....	1,208	18,648,400	1,749	19,687,375	2,957	38,335,775
1916.....	2,447	32,404,100	686	7,506,750	3,133	39,910,350
1917.....	4,977	73,456,140	409	7,059,665	5,386	80,515,805

AUTOMOBILE IMPORTS INTO ITALY
(7 months ending July 31)

Year	Lorries	Value in Liras	Cars	Value in Liras	Total	Value in Liras
1915.....	4	29,000	236	2,933,160	240	2,962,160
1916.....	10	103,000	192	2,069,000	202	2,172,000
1917.....	10	20,000	74	612,000	84	632,000

French Motorists on War Basis

No Gasoline to Be Sold to Private Owners—Provision Made for Taxicabs and Government Contractors—Owners May Use Hoarded Gasoline

PARIS, Dec. 3.—French motorists were put on a complete war basis this month by the withdrawal of all permits to purchase gasoline for touring or privately-owned cars. For a considerable time the automobile owners of France have been furnished with gasoline cards which allowed them first to purchase 66 gallons and later 22 gallons per month. Cards were renewed as usual in November, but a little later a notice was issued to the effect that these cards could not be honored. It was intimated at first that the measure would be only of a temporary nature, and had been adopted in order to allow the authorities to get the military reserves above the minimum figure considered necessary in the interests of the forces. Later, automobile owners have been made to understand that the present restrictions may continue for a considerable time, for it is essential that the army should have a plentiful supply for the present and the immediate future.

Although the no-gasoline order has been in force for more than a week very little difference is apparent on the streets of Paris. This is explained by the fact that provision is made for taxicabs and that numbers of privately-owned cars are in the hands of men who are engaged on Government contracts and that fuel must be provided for these men out of Government reserves. Further, many owners have laid by stocks of gasoline and can continue to run, with economy, for several months.

No Decree Against Use of Cars

There is no decree against the use of automobiles, and the police are not concerning themselves with the manner in which owners of cars now on the road secured their stock of gasoline. This is a much more liberal spirit than has been shown in England, where owners having a reserve stock are not allowed to use it.

The new decree brings France in line with her neighbors—England and Italy. In the latter country there has been no gasoline for more than a month for private car owners. In England not only is there no gasoline but private motoring has been forbidden in all but the most urgent and necessitous cases. The Britisher, however, who is deprived of gasoline finds a certain amount of relief in the use of coal gas which is readily procurable in all manufacturing districts and generally costs much less than gasoline at pre-war rates. France has not and never will make use of coal gas, for not only is it costly but distances between towns are too great to make it a practical fuel.

Although not generally realized by the public, the efforts to limit gasoline consumption are just as important in the army as in civilian circles. The Italian army is the one which has been most poorly supplied with gasoline and also the one having had to exercise the greatest economy. The Italian authorities do not allow the use of any staff cars of more than 4-in. bore, and the greatest proportion of their work is done with four-cylinder cars of 3.1 or even 2.7-in. bore.

Officers Use Small Cars

The French limits are not so low, but for town service practically all the big cars have been replaced by two- and four-cylinder taxicabs of 10 to 12 hp.

The notion, which existed at the beginning of the war, that a big six-, eight-, or twelve-cylinder car was necessary for every type of military service has been expelled from the minds of all European military men. Only American officers claim that Packards and Cadillacs are indispensable.

The recent activities on the French, British and Italian fronts have been responsible for a considerable increase in gasoline consumption. Not only have the British been making a great use of tanks, which are heavy gasoline consumers, but they have moved a very considerable army from Belgium, across the whole length of France and into the heart of Italy, a distance in many cases of 1500 miles entirely by road.

When Italy was in danger both France and England immediately went to her assistance. Naturally the railroads between France and Italy were worked to their limits, military trains being sent through without interruption, to the entire exclusion of civilian traffic, and the trains being sent back empty for more troops so as not to lose time in loading them in Italy.

Good French and Italian Roads

Fortunately there exists a fine system of roadways between Italy and France and these also were worked to the limit of their carrying capacity, automobile convoys crossing in an unceasing procession over the mountain passes which more than 100 years ago had seen the passage of Napoleon's troops. Most of these roads are at a height of 5000 to 6000 ft. above sea level and are snowed up during a portion of the winter. Gangs of soldiers were told off not only to keep the roads free of snow, but to enlarge and repair the passes wherever this work was necessary, while traffic police prevented congestion in the narrow mountain village streets and big warning notices in the language spoken by the troops gave indication of all danger spots such as narrow bridges and winding hills it was considered desirable to descend with the engine shut off and the car in low gear. A more eloquent testimony to the value of good roads it would have been impossible to imagine. Well made, well graded, and well kept military roads enabled France and England to come to the rescue of invaded Italy. Without those roads the assistance would have been less rapid and less efficient. Roads and automobiles did not save Italy, but they helped, and helped in a very important degree.

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Cleveland Tractor Show Next August

CLEVELAND, OHIO, Dec. 21—The national exhibition of the tractor and thresher department of the National Implement & Vehicle Association will be held here next August, according to an announcement made by the Chamber of Commerce. The headquarters and main exhibit will be at the Good Gold farm near Willoughby, where 4000 acres of land are available. It is expected that the exhibit will be larger than the last one held at Fremont, Neb., where forty-eight tractors were exhibited. The exhibition in this city will be one of eight to be held in the country next year. Five tractor makers have already applied for space in the Cleveland Automobile Show which will be held in the Wigmore Coliseum, Jan. 19 to 27. These are the Ohio Happy Farmers, the J. T. Tractor Co., the Avery, the Case, and the Cleveland.

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Landover in Production

MENOMINEE, MICH., Dec. 21—The Landover Truck Co. is now in production and expects to be turning out four trucks per day in the near future.

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Plan 50 Nelson Trucks a Month

SAGINAW, MICH., Dec. 21—The Nelson Bros. Co. has completed its first two-ton truck and fifty more are planned within the next two months. These are to be styled the "Jumbo" trucks and an addition will soon be made to the factory so that nearly all the units can be manufactured. At present the truck is being assembled. The price has not yet been determined.

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Avery Company Earns 29 Per Cent

CHICAGO, Dec. 22—The Avery Co. has earned net profits of $771,000 during the 11 months ending Nov. 30. This sum equals 29 per cent on the $2,414,000 common stock after the year's dividend on the preferred stock has been deducted. The company's gross sales were greater than those of the corresponding period of 1916, but increased taxation left the net profits equal to 1916.

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Adams to Assist Horning

WASHINGTON, D. C., Dec. 21—H. J. Adams, sales manager of the Garford Motor Truck Co., has been appointed assistant to H. L. Horning in the Automotive Products Section of the Council of National Defense.

Army of Mechanics for France

Work Abroad Requires Several Thousand Machinists and Other Skilled Men

WASHINGTON, D. C., Dec. 26—Training quarters will be established in England and France for a corps of several thousand mechanics to repair and care for the machines of American airmen. Washington has been asked to send 13,000 bricklayers and carpenters and also a large number of laborers for construction work at the training quarters in England. When the work in England is completed the construction men will go to France to build quarters there. It is inadvisable to mention the number of men who will be trained in England. It is sufficient that the army is determined to have more than enough efficient men available, for American success in the air will depend primarily upon this corps of mechanics.

Flying schools for Italian aviators will be established in the United States for two purposes. First, conditions in the United States are better than in Italy, and second, the utilization of training airplanes and equipment in the United States will save the tonnage involved in transportation to the other side.

Expeditionary headquarters in France have recommended that the United States government provide for the construction of schools, the manufacture of airplanes and engines of Italian models and the feeding and housing of skilled pilots and students, the expenses of which will be met at a later day by Italy at a price which will be determined some time in the future. It is planned to have this program effective by the middle of 1918.

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Cassidy Takes Rajah

NEW YORK, Dec. 24—The Edward A. Cassidy Co. has taken over the distribution of the Rajah spark plug, which has been manufactured for 16 years by the Rajah Auto Supply Co., Bloomfield, N. J. The company will continue its manufacturing as usual, Cassidy acting as the sales department. The Cassidy company is also acting in a similar capacity for the Corning conaphore, Corning Glass Works, Corning, N. Y., and G. P. muffler cut-out, Long Horn, G. Piel Co., Long Island City, N. Y.; Cassco engine-driven tire pump, West Side Foundry Co., Troy, N. Y.; Kimball auto jack, F. W. Mann Co., Milford, Mass; Tenion piston ring, Dubois Piston Ring Co., Albany, N. Y.

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New Airplane Company in Cleveland

CLEVELAND, OHIO, Dec. 20—The Lee Royal Aviation & Engineering Manufacturing Co., has been incorporated with a capital of $100,000 to manufacture airplanes and motors.

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Dunkle and Broderick in New Positions

C. T. Dunkle, formerly manager of the Columbus branch of the Willys-Overland Co., has organized a $100,000 company under the style Overland-Dunkle Co. to take over Overland sales in central Ohio territory.

E. N. Broderick, accessories salesman, has been appointed special representative of the Burd High Compression Ring Co., Rockford, Ill.

Duplex Truck Nets $92,000

In First Year of Existence Earns Substantial Dividend

LANSING, Dec. 19—Net profits of the Duplex Truck Co. from Nov. 23, 1916, when the company was reorganized to Oct. 31, 1917, were $92,002.10. This was announced at the annual meeting to-day. H. F. Harper, Elgin Miffin, H. E. Bradner, G. W. Hewitt and H. M. Lee were re-elected directors. The assets and liabilities follow:

Assets

Land, buildings, machinery and equipment at cost less depreciation	$349,002.48	
Reserve for depreciation	15,668.57	$333,333.91
Patents at cost	$185,545.47	
Trade marks, good will, etc.	100,000.00	285,547.47
Raw materials and supplies	$287,893.09	
Finished trucks	86,500.00	374,393.09
Notes receivable		7,887.84
Accounts receivable		81,336.03
Cash on hand		28,621.09
Insurance and taxes prepaid		2,716.75
		$1,113,854.18

Liabilities

Capital stock authorized	$1,000,000.00
Capital stock issued, 99,670 shares	996,700.00
Less unpaid subscription	112,355.00
Amounts payable sundry creditors	39,684.72
U. S. Government tax	2,145.57
Accrued payroll	5,191.09
Reserve for Federal income tax and excess profits tax	14,685.00
Net profits, Nov. 23 to Oct. 31, 1917	92,110.10
	$1,113,854.18

Automotive Securities Quotations on the New York and Detroit Exchanges

	Bid	Asked	Net Ch'ge
*Ajax Rubber Co	45	45½	—4½
*J. I. Case T. M. Co. pfd	73¼	76	—2
Chalmers Motor Co. com	2	4	..
Chalmers Motor Co. pfd	..	50	..
*Chandler Motor Co	62	63¼	+1¼
Chevrolet Motor Co	77	77½	+13½
*Fisher Body Corp. com	20	34	..
*Fisher Body Corp. pfd	75	85	+5
Fisk Rubber Co. com	..	45	..
Fisk Rubber Co. 1st pfd	98	103	..
Fisk Rubber Co. 2nd pfd	60	70	..
Firestone Tire & Rubber Co. com	96	98	—1
Firestone Tire & Rubber Co. pfd	96	98	—2
*General Motors Co. com	91½	93	+6
*General Motors Co. pfd	73	75	..
*B. F. Goodrich Co. com	34½	36	+ ½
*B. F. Goodrich Co. pfd	90	93¼	—2¼
Goodyear Tire & Rubber Co. com	135	140	—10
Goodyear Tire & Rubber Co. pfd	—93	—96	—1
Grant Motor Car Corp	1½	3	..
Hupp Motor Car Corp. com	1½	2½	+ ¼
Hupp Motor Car Corp. pfd	72	78	—1
International Motor Co. com	8	12	—1
International Motor Co. 1st pfd	30	50	..
International Motor Co. 2nd pfd	15	25	..
*Kelly-Springfield Tire Co. com	38	39	..
*Kelly-Springfield Tire Co. 1st pfd	70	76	—4
*Lee Rubber & Tire Corp	12	12½	— ½
*Maxwell Motor Co., Inc., com	21	22½	—2½
*Maxwell Motor Co., Inc., 1st pfd	51	53	—1
*Maxwell Motor Co., Inc., 2nd pfd	19	20	—1
Miller Rubber Co. com	130	140	..
Miller Rubber Co. pfd	95	98	..
Packard Motor Car Co. com	100	105	—10
Packard Motor Car Co. pfd	92	96	..
Paige-Detroit Motor Car Co	11	12½	— ½
Peerless Truck & Motor Corp	9	13	..
Portage Rubber Co. com	109	111	..
Regal Motor Car Co. pfd	..	20	..
Reo Motor Car Co	15	16	—1
*Saxon Motor Car Corp	5½	6½	— ½
Springfield Body Corp. com	..	..	..
Springfield Body Corp. pfd	..	..	..
Standard Motor Construction Co	7½	8½	..
Standard Parts Co	..	75	..
*Stewart-Warner Speed. Corp	44	46	+1
*Studebaker Corp. com	44½	45½	+3
*Studebaker Corp., pfd	75	81	—15
Swinehart Tire & Rubber Co	16	26	..
United Motors Corp	16½	16¾	+1½
*U. S. Rubber Co. com	49½	51	+2
*U. S. Rubber Co. pfd	91½	93	+2
*White Motor Co	34	36	+1
*Willys-Overland Co. com	18	20	+1½
*Willys-Overland Co. pfd	68½	70	—1

*At close Dec. 22, 1917. Listed N. Y. Stock Exchange.

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

ACTIVE STOCKS

	Bid	Asked	Net Ch'ge
Auto Body Co	..	8¾	..
Bower Roller Bearing Co	..	..	..
Chevrolet Motor Co	75	78	+15
Commerce Motor Car Co	..	..	..
Continental Motor Co. com	5	5¼	— ⅛
Continental Motor Co. pfd	..	..	..
Edmunds & Jones com	..	..	..
Edmunds & Jones pfd	..	..	..
Ford Motor Co. of Canada	145	150	—1
Hall Lamp Co	..	16	..
Michigan Stamping Co. com	12¼	..	..
Motor Products	..	..	..
Packard Motor Car Co. com	..	100	..
Packard Motor Car Co. pfd	..	93	..
Paige-Detroit Motor Car Co	11¼	..	— ¼
Prudden Wheel Co	10½	11¼	— ¼
Reo Motor Car Co	15½	15⅝	+1

INACTIVE STOCKS

Atlas Drop Forge	..	32	..
Kelsey Wheel Co	80	88	..
Regal Motor Car Co	..	26½	..

How Mexico Tested Army Trucks

Quartermaster - General in Annual Report Outlines Working Conditions

WASHINGTON, Dec. 23—The annual report of the Quartermaster-General of the Army just submitted to the Secretary of War contains an interesting chapter about motor transport. It sets forth in considerable detail that during the fiscal year 1917 a large part of the motor transport activities of the army was confined to the southern department.

During the period when the punitive expedition was operating in Mexico, the expedition was supplied almost entirely by means of motor trucks. In addition to the troops in Mexico those troops stationed along the Mexican border were supplied by motor trucks whenever the distances were so great as to render animal transport difficult or wherever the roads were satisfactory or at all suitable for truck transportation. This experience rendered it possible for the War Department to pursue its investigations in the matter of motor transport under conditions unusually favorable for the development of a type of motor truck suitable for the military service.

As a result, with the co-operation of truck manufacturers and engineers, covering practically all the principal makers and the principal corporations in the country, valuable data were collected throughout the year and later on utilized in the standardization of trucks.

Thirteen different types of trucks made by eight manufacturers were sent into Mexico and along the border at the time of the operation of the punitive expedition.

When the punitive expedition was withdrawn from Mexico a large number of truck companies employed in that section became surplus. These had been run constantly for a period of a year or more, undergoing only such repairs as it was practicable to afford at short intervals while they were laid up.

Shops established at El Paso and San Antonio for maintaining these trucks have been actively operated in the rebuilding of a large number of trucks, and as truck companies have been rebuilt they have been distributed to various camps and cantonments occupied by troops of the National Army. Their utilization at cantonments has greatly decreased the cost of construction and upon completion of construction they have become available for utilization by the troops stationed at these points.

In March, 1917, the shops established at the Columbus base, New Mexico, were dismantled and the transfer of the machinery was completed in May, 1917. Since February last, 567 trucks and 24 motor cars were shipped from the southern department to other departments, all of which were completely overhauled before shipment was made.

Exhaustive tests of trucks, tractors and trailers have been made in the Big Bend district from Marfa, Tex., to points on the Mexican border, varying in distance from 86 to 129 miles over mountainous country, where poor roads, steep grades and long stretches of sand form a combination to demonstrate whether motor transport would meet the Government requirements. Tests were made under the following conditions:

Trucks were leased to the Quartermaster Corps at a nominal rental for a period of time necessary to operate over a distance of 2,000 miles.

The Quartermaster Corps furnished the necessary chauffeur and services for the operation of the truck, and provided oil, gasoline and other materials.

Trucks were maintained by the Quartermaster Corps, except that broken parts were replaced and changes in construction made at the expense of the manufacturer. The truck was delivered to the Quartermaster Corps at the point designated by the officer conducting the test, and returned to the manufacturer at the point where the test was concluded.

The report shows that during the fiscal year ended June 30, 1917, the following motor transportation was purchased, except in the Philippine Islands: 1396 motor trucks, $3,701,958; 420 motor cars, $416,343; 645 motorcycles, $192,168.

Motor transportation in use June 30, 1917, except in the Philippine Islands, amounted to: 2,965 motor trucks, $8,223,719; 58 motor tank trucks, $196,100; 12 motor machine shop trucks, $41,603; 6 motor wrecking trucks, $25,438; 437 motor cars, $454,632; 670 motorcycles, $190,801.

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England's Road Transport

LONDON, ENGLAND, Dec. 12—Not so great progress as was expected has been made in the greater use of highways in England for moving of freight and correspondingly relieving the railroads of such burden. The Highways Transport Committee, which had this work in charge, did not work out its scheme in all details.

The general principle with regard to road transportation is that no freight should be transported by railroad over a distance less than 20 miles from any of the chief centers, such as London, Birmingham, Liverpool, etc., but that all freight in such zones should be handled over the highways by motor truck or other means.

There have been some spasmodic efforts along these lines but it has not been general, and no effort of a concerted nature which might result in a national movement has taken place.

Unfortunately the magnificent canal system in England has been almost stifled by the past jealousies of the railroads, so that two of the basic systems of transportation, namely, canals and highways have not obtained that efficiency which war times require.

The Munitions Transport Department has the railway matters pretty well worked out and in recent months this department has spread itself out into the Munitions Inland Transport Department, which covers all internal transport by railroad, by highway, and by canal.

London Bus Weight Is 3½ Tons

Thirty-Four Passenger Type Best—Two Sets of Rear Wheel Brakes

LONDON, ENG., Dec. 12—The police commissioner of London, who is the authority for licensing public vehicles, has recently issued a memorandum concerning the future weights of motor buses. The fact that residents are complaining about excessive vibration of these vehicles and damage to their property has doubtless had some influence on the commissioner's views. The commissioner believes that the weight of the unladen bus should not exceed 3½ tons, and when fully laden 6 tons. Seating capacity of thirty-four persons is favored. The overall length of the bus must not exceed 23 ft. and the overall width 7 ft. 2 in.

One of the recommendations is that each bus must be provided with two effective and independent brakes operating on the rear wheels. The tread of the buses must not be less than 5 ft. 6 in. from the center of tires for both front and rear wheels. The distance between the outsides of the rear springs shall not be less than 45 in. and the distance between the outside edges of the front springs not less than 38 in.

Hopes to Save Roads

The commissioner does not propose to insist upon vehicles of smaller dimension or with less carrying capacity than existing types, but he does hope to reduce the effect on the road by a careful reconsideration of all the details of construction of the chassis, road wheels, power and transmission mechanisms, including the use of modern materials of high tensile strength, with the hope that the weight reduction thereby effected will compensate for any slight additions of weight needed for the improvements of springs, wheels, etc. The commissioner, it is understood, will agree to some increase of weight in component parts necessary to secure improvement in spring suspension and in the wheels, the object aimed being the reduction of impact shock, more especially on damaged road surfaces.

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Republic Trucks in Far East

ALMA, MICH., Dec. 26—The Republic Motor Truck Co. has received an initial order from H. S. Honingberg & Co., China, for 15 trucks to be shipped immediately. Fifteen others are on their way to Japan, and the company is filling an order for fire trucks to be sent to Manila.

—

Mexico Buys Tractors

MEXICO CITY, Dec. 22—The Mexican Government has expended $100,000 (American gold) in the purchase of tractors for farmers in the Laguna district of the States of Coahuila and Durango.

Industrial Review of the Week

A Summary of Major Developments in Other Fields

ZERO WEATHER AND SNOW IMPEDE COAL DELIVERIES

The severe cold wave which descended upon the country somewhat over a week ago has produced ill-effects in two directions—by interfering with mine operation and by hindering freight movement and distribution. The depth of snow in the anthracite region has been excessive for the time of year, in some places there being from 20 in. to 2 ft. on the ground. So difficult has this rendered car movement that in some instances collieries for even whole districts have been shut down for short periods. The loss of production has, however, been less than might have been expected. On the other hand, weather in the neighborhood of zero has rendered recovery of culm from the banks wellnigh impossible, as this material being wet freezes readily. The cold weather thus interferes seriously with the flushing of this material to the conveyor lines. Washeries, also, whether preparing culm or freshly mined coal have experienced serious difficulty on account of the extremely low temperatures. The most serious result of the cold, however, has been the precipitation of snow and the serious interference thus caused with car movement. The movement of coal has thus been slow and uncertain and the cost of unloading at destination has been excessive.

The distribution of coal to the ultimate consumer was rendered highly difficult by snow-clogged streets and slippery pavements. Demand was also greatly intensified by the cold, as might be expected. In all the larger cities consuming anthracite, long coal lines besieged the offices of the smaller dealers, some of whom had their yards swept bare, while others were able to dole out small quantities of fuel to their customers.

The conditions above enumerated covering the anthracite situation were equally potent in the bituminous market. From everywhere comes the report of railroad congestion, slow car movement, insistent demand and impossible delivery. The call for coal was, of course, urgent among the poor of the larger cities, and those who habitually purchase their supplies in small amounts. The local fuel administrators in many cities have been kept busy relieving cases of suffering. Authorities in Kentucky went so far as to confiscate a large amount of coal which had long been standing on side-tracks awaiting transportation northward. This coal was distributed throughout local territory, and the cars thus relieved returned to the mines for reloading. It is stated they can be returned to the various junction points, again loaded and ready for delivery northward by the time they can be accepted by the northern transportation lines. Various expedients have been adopted, or are in contemplation by fuel administrators and consumers. Many industrial plants finding themselves desperately short of stocks have determined to close down for from one to two weeks at the coming holiday season, in the hope of accumulating sufficient supplies to render a fresh start possible, with reasonable assurance of continued operation during the balance of the winter. School boards are in many instances adopting a similar program with reference to the public schools.

During the past week there was, in many instances, not enough coal to satisfy priority orders. Thus many by-product ovens did not receive sufficient fuel to keep them in continued operation. The priority situation has become so complicated and muddled that there is a strong feeling that all the priority orders should be abolished and a fresh start made. It is doubtful if this program will be followed until the President has made the recommendation to Congress concerning the management of the railroads.

The lake season is, of course, closed, and thus far, due possibly to difficult transportation, no benefit has been derived from this fact.—*Coal Age.*

A New Service

¶ Herewith AUTOMOTIVE INDUSTRIES *supplies for the benefit of its readers a general summary of important developments in other fields of business. This is rendered possible by the editorial co-operation of leading industrial publications which are recognized authorities.*

By compressing the general industrial situation into this form we hope to give our readers a clear and comprehensive idea of up-to-the-minute developments which they could otherwise secure only with considerable expenditure of time and effort.

STEEL PRICE SCHEDULES NOT TO BE CHANGED

In the closing days of 1917 the steel trade has the satisfaction of knowing that it will enter the new year free from the fear that present price schedules may be overturned. The War Industries Board, after a conference on Saturday with the Federal Trade Commission, has recommended to the President the indefinite extension after Jan. 1 of the prices promulgated late in September and those built upon them in the past three months.

It is expected that the President will issue a proclamation shortly extending the operation of the present schedule. Whether a definite period will be named remains to be seen, but it is believed that some readjustments will come within the next 90 days.

Recent rumors of a sentiment in a part of the Federal Trade Commission in favor of some reduction in pig iron led to a meeting of merchant producers in New York Dec. 20 at which a committee was appointed to present the case of the smaller furnaces. It was urged that a reduction in price would cause some of them to close down and only aggravate the existing famine in pig iron.

The manufacturers' committee on steel and steel products made an important announcement of additional prices this week, putting forging ingots at $73 per ton, splice bars and tie plates at 3.25c. per lb., rail steel bars at 3c., steel spikes at 3.90c., iron spikes at 4.50c., track bolts at 4.90c. and cut nails at $4 per keg, and fixing schedules on steel castings and cast-iron pipe. Some of the above products had been gradually adjusting themselves to the new market basis so that the formal announcement meant no abrupt change. On cast-iron pipe the official prices, $49, Birmingham, and $55.35, New York, for 6-in. pipe are but fractionally below the recent market.

The committee's action on old material is an attempt to cope with one of the most difficult problems in the trade. In view of the development that with a fixed price railroads and other sellers would deal with consumers direct in order to get the maximum, the committee recommends a commission of not to exceed 3½ per cent to recognized scrap dealers or brokers.

The precedent of a quiet holiday week in pig iron is broken, as the real effect of the fuel shortage is brought home to consumers. Steel production has been kept up this year by drawing on pig iron stocks. Now that these are gone there is a scramble for iron that would by this time have sent prices skyward but for Government regulation. It is estimated that Central Western steel companies would now be buying fully 250,000 tons of basic iron to make up their shortages, if it could be had.

In Chicago and the Middle West there is active inquiry for basic, foundry and malleable irons. Steel companies are seeking merchant iron as their own furnace outputs are cut down, and some foundry firms having Government contracts are facing the necessity of calling on the Government to provide them with pig iron. This would mean that iron already sold would be requisitioned and that some foundries turning out less essential products would go without. The fuel shortage has already gone to the point of curtailing the output of a number of foundries. The situation simply represents the gradual tightening of the lines in the absorption of iron and steel for war needs.—*Iron Age.*

Men of the Industry

Changes in Personnel and Position

C. B. Rose Leaves Velie—Joins Federal War Board

MOLINE, ILL., Dec. 23—L. H. Hazard, formerly chief engineer of the Velie Motors Corp., has been appointed superintendent of production to succeed C. B. Rose, who is in the war department at Washington. G. E. Martin, New York, is chief engineer.

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N. W. Secor has been appointed traffic manager of the Olds Motor Works, Lansing.

—

L. D. Maxson, formerly connected with the purchasing department of the Olds Motor Works, Lansing, has been appointed purchasing agent, to succeed C. O. Miller. Miller is in Washington on a government service board.

—

J. C. Matlack, former secretary and general manager of the Ajax Rubber Co., New York, has been elected president and general manager of the Globe Rubber Tire Mfg. Co., New York.

—

Joseph G. Gorey has received a commission as lieutenant in the Automotive Products Division of the United States Army.

—

O. Wellington Snell has been appointed sales manager of the Guaranty Truck Sales Co., Boston, and will be sole distributor of the Guaranty truck in New England.

—

Maurice R. Sanborne is now assistant sales manager of the Commonwealth Finance Corp., New York.

—

B. L. Craig, president of the R. N. Vehicle Woodwork Co., St. Louis, has resigned the presidency of the Combined Motors Corp., Chicago.

—

Joseph J. Martin has been appointed district manager of the Lippard-Stewart Motor Car Co., Buffalo, for territory from Toledo to the Pacific Coast. William M. White will handle the territory from Pittsburgh to the Atlantic Coast and S. C. Harvey will take the district from Ohio south to the Gulf of Mexico.

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John S. Speck is production manager of the Lippard-Stewart Motor Car Co., Buffalo.

—

Walter Phipps has resigned as general manager of the Hercules Motor Mfg. Co.

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Charles T. Bailey, formerly with the Hal Motor Car Co., Cleveland, has been appointed assistant sales and advertising manager of the Templar Motors Corp., Cleveland.

—

Goethals Remains Wright-Martin Head

WASHINGTON, D. C., Dec. 24—Major-General Goethals of the Quartermaster Corps will retain his position as president of the Wright-Martin Aircraft Corp., despite his new appointment as Quartermaster-General.

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W. E. Dugan, formerly with the Selden Motor Vehicle Co., Rochester, has been appointed factory manager of the United States Motor Truck Co., Cincinnati.

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A. N. Martin, formerly industrial agent of the Baltimore and Ohio Ry. Co., is now general sales manager of the Fulflo Pump Co., Cincinnati.

—

R. D. Henshaw, for the last 10 years in charge of the New England and New York sales districts of the Michelin Tire Co., has resigned.

—

S. W. Kesler, formerly special representative of the Abbott Corp., Detroit, has received the commission of captain in the Aviation Section of the Signal Corps. He will sail for France at once.

—

What California Is Buying

SAN FRANCISCO, Dec. 24—Registration of new cars in the state of California from Jan. 1 to Dec. 1, 1917, for twenty-five different makes of passenger cars and trucks, with a total of at least 400, was as follows:

Ford	35,091	Dort	832
Dodge	5,173	Chalmers	752
Overland	4,818	Hupmobile	701
Buick	4,732	Oldsmobile	675
Chevrolet	4,245	Grant	599
Studebaker	2,942	Paige	562
Maxwell	2,504	Franklin	502
Saxon	1,335	Haynes	459
Chandler	1,245	Republic Truck	445
Oakland	1,171	Velie	439
Hudson	1,101	Packard	405
Cadillac	976	Mitchell	403
Reo	960		

—

DIVIDENDS DECLARED

The Hupp Motor Car Co. has declared the regular quarterly dividend of $1.75 a share, on the preferred stock, payable Jan. 1 to stock of record Dec. 20.

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Hendee Mfg. Co. has declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable Jan. 1, to stock of record Dec. 20.

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Change of Capital

DECATUR, ILL., Dec. 22—The capital of the Mixrite Carburetor Co. has been increased from $30,000 to $75,000, the additional amount being raised to increase the capacity of the plant.

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CLEVELAND, Dec. 21—The Ideal Tire & Rubber Co. has increased its capitalization from $1,000,000 to $2,000,000.

Current News of Factories

Notes of New Plants—Old Ones Enlarged

Southern Wisconsin Foundry Starts Work on New Plant

MADISON, WIS., Dec. 24—The Southern Wisconsin Foundry Co., manufacturer of castings for machine tools and gas engines, has started work on the erection of a foundry and machine shop to replace the plant destroyed by fire last December.

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MILWAUKEE, Dec. 24—The Liberty Foundry Co. has broken ground for its new plant at Wauwatosa. The building will be 65 x 130 and cost $20,000.

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EDGERTON, Dec. 24—The Highway Trailer Co. has increased its facilities by leasing a building adjoining its plant. It will be used for finishing, testing and painting.

—

APPLETON, WIS., Dec. 24—The Reliance Motor Truck Co. has decided to build a larger plant than originally intended. This will be 75 x 300 and arranged so that units of equal size may be added. Bids will be received Jan. 1, and it is hoped to have the plant in operation by March 15.

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PEORIA, ILL., Dec. 22—The Avery Co. has purchased 96 per cent of the capital stock of the Davis Mfg. Co., Milwaukee. The Davis Co., for the last 2 years, has supplied motors to the Avery Co.

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Manly Reorganized; Adds Model

CHICAGO, Dec. 24—The Manly Motor Corp., Waukegan, Ill., has been reorganized under the style O'Connell-Manly Truck Co., and will bring out a 1-ton truck to sell for less than $1,400. It expects to build 600 to 750 of these for 1918.

E. J. Manly remains president of the reorganized company, and H. P. Manly, secretary. Edwin Page, the former treasurer, has been elected vice-president, and William L. O'Connell, former Commissioner of Public Works, Chicago, will be treasurer.

The new 1-ton truck will have a 3½ by 5 engine, with Dyneto starting and lighting, Delco ignition and pneumatic front tires. Although other Manly models are designed to operate on kerosene or gasoline, this model will use gasoline only.

The 2- and 2½-ton models will be continued. In place of the 3-ton model there will be one of 3½ tons. Three sizes of tractors will be built, all of the semi-trailer type. A 3-ton tractor will use gasoline only, and the 5- and 7-ton models either gasoline or kerosene.

BETTER ROAD SERVICE UNDER FEDERAL CONTROL

(*Continued from page* 1153)

the automobile industry before the railroad war board.

For some time the special automobile freight cars which were supposed when unloaded by a dealer to be returned at once to the factory, have not been returned, but have entered into regular railroad freight car pooling as done by the different lines. This means that many of these special freight cars have gone out of automobile service and are used in other lines. There are several factories that are held up with automobile shipments for lack of freight cars, but this is always true at this season.

More Capital for Mixrite

DECATUR, ILL., Dec. 23—The stock holders of the Mixrite Carburetor Co. met this week and voted to increase the capital stock from $30,000 to $75,000, and the board of directors from four to five. Volney Mount, Marshal, Ill., and M. E. Hornback, Decatur, Ill., were elected new directors. Officers were then elected as follows: President, W. E. Coombe, vice-president, A. A. Granger; secretary, Volney Mount; treasurer, E. H. Williams.

—

Tri-City Dealers Organize

ROCK ISLAND, ILL., Dec. 23—Formation of the Tri-City Automobile Trade Association took place at a meeting of dealers in Rock Island this week. Officers were elected as follows: President, Harry Wolfer, Davenport; first vice-president, L. F. Haemer, East Moline; second vice-president, Fred Young, Moline; secretary-treasurer, H. W. Horst, Rock Island. Fifty dealers of Rock Island, Moline and Davenport were represented. Preliminary to this meeting three organizations previously existing, known as the Tri-City Automobile Trade Association, the Rock Island County Automobile Trade Association, and the Scott County Automobile Trade Association, were formally dissolved, all officers resigning. Fifteen dealers were brought into the new association who, previously, had not been identified with either of the old.

Calendar

ASSOCIATIONS

1918

Jan. 3-4—New York Automotive Electric Assn. meeting.
Jan. 7-8—New York, National Automobile Dealers' Assn. directors' meeting with vice-presidents from Eastern States.
Feb. 4-7 — St. Louis, American Road Builders' Assn. Convention.

SHOWS

Dec. 26-29—Quincy Ill., Quincy Motor Car Dealers' Armory. L. B. Bartlett, Mgr.

1918

January — Kalamazoo, Mich., Kalamazoo Automobile Dealers' Assn., Armory.
Jan. 2-9—New York, Salon, Automobile Salon, Inc., Astor Ballroom. John R. Eustis, Mgr.
Jan. 5-12 — New York Show, Grand Central Palace, National Automobile Chamber of Commerce.
Jan. 11-19 — Philadelphia, 17th Annual Show, Philadelphia Auto Trade Assn., Commercial Museum Bldg.
Jan. 11-19—Providence, R. I., R. I. Licensed Auto. Dealers' Assn., State Armory. Percival S. Clark, Mgr.
Jan. 14-19 — Rochester, N. Y., Tenth Annual Exposition Park. C. A. Simmons, Mgr.
Jan. 16-27 — Milwaukee, Wis., Milwaukee Automobile Dealers, Inc., Auditorium. (First 7 days, passenger cars; last 3 days, commercial cars.) Bart J. Huddle, Mgr.
Jan. 18-24 — Des Moines, Ia., Ninth Annual Passenger Car and Second Annual Truck, Des Moines Automobile Dealers' Assn., Coliseum. C. G. Van Vliet and Dean Schooler, Mgrs.
Jan. 19-26—Detroit Automobile Dealers' Assn., Overland Bldg. H. H. Shuart, Mgr.
Jan. 19-26 — New York Motor Boat Show, Grand Central Palace, National Assn. of Engine and Boat Manufacturers.
Jan. 19-26—Detroit, Willis Avenue Overland Service Station.
Jan. 19-27 — Cleveland, Seventeenth Annual. Cleveland Automobile Show Co., Wigmore Coliseum. Fred. H. Caley, Mgr.
Jan. 19-28 — Montreal, Can., Montreal Automobile Trade Assn., Ltd., Almy Bldg. T. C. Kirby, Mgr.
Jan. 21-26—Manchester, N. H., Academy. Couture Bros.
Jan. 21-26—Scranton, Pa., Scranton Motor Trades Assn., Armory. Hugh B. Andrews, Mgr.
Jan. 21-26—York, Pa., Queen Street Tabernacle, York Automobile Dealers' Assn.
Jan. 21-26 — Wilmington, Del., Hotel Du Pont.
Jan. 21-26—Buffalo, N. Y., Buffalo Automobile Dealers' Assn., Broadway Auditorium.
Jan. 22-24—Montreal, Can., Convention of All Men Interested in the Automobile Industry in Eastern Canada.
Jan. 22-26—Baltimore, Md., Baltimore Automobile Dealers' Assn. and Automobile Club of Maryland, 5th Regiment Armory.
Jan. 22-26 — Oklahoma City, Okla., Oklahoma City Automobile Dealers' Assn., 701 No. Broadway. Roy H. Haun, Mgr.
Jan. 23-28—Allentown, Pa., Lehigh Auto. Trade Assn., Traylor Motor Co.'s Garage. P. W. Leisering, Publicity Mgr.
Jan. 26-Feb. 2 — Chicago National Show, Coliseum and Armory, National Automobile Chamber of Commerce.
Jan. 26-Feb. 2—Chicago, Salon, Elizabeth Room of Congress Hotel.
Jan. 26-Feb. 2—Bridgeton, N. J., Bridgeton Auto Dealers' Assn. O. P. Riley, Sec.
Jan. 26-Feb. 2—Harrisburg, Pa., Capital City Motor Dealers' Assn. J. Clyde Myton, Mgr.
Jan. 26-Feb. 3—York, Pa., York County Auto. Dealers' Assn., Tabernacle. T. F. Pfeiffer, Sec.
Jan. 28-Feb. 2—Buffalo, N. Y., Buffalo Automobile Dealers' Assn., Broadway Auditorium.
February — Greensburg, Pa., Westmoreland Automobile Dealers' Association.
Feb. 2-16—Bronx, N. Y., Bronx Auto. Dealers' Assn., Second Battery Armory. D. J. Barrett, Chairman Show Committee.
Feb. 5-9—Binghamton, N. Y., Binghamton Automobile Dealers' Assn., Kalurah Temple. William M. McNulty, Mgr.
February — Peoria, Ill., Peoria Auto and Accessories Dealers' Assn. W. O. Ireland, Mgr.
Feb. 6-9—Lancaster, Pa., Automobile Track Assn., Fidelity Bldg. R. W. Shreiner, Mgr.
Feb. 9-16 — Bronx, N. Y., 2d Battery Armory, Bronx Automobile Dealers' Assn. D. J. Barrett, Mgr.
Feb. 11—Toledo, Terminal Auditorium, Toledo Auto Show Co.
Feb. 11-16—St. Louis, Mo., St. Louis Auto Mfrs. & Dealers' Assn. Robert E. Lee, Mgr.
Feb. 11-16 — Kansas City, Mo., Kansas City Motor Car Dealers' Assn., Convention Hall. E. E. Peake, Mgr.
Feb. 11-16—Kansas City, Mo., Third Annual National Tractor Show.
Feb. 16-23—New York, Second Pan-American Aeronautic Exposition, Grand Central Palace and Madison Square Garden.
Feb. 16-24—San Francisco, Cal., San Francisco Dealers' Assn., Exposition Auditorium. G. A. Wahlgreen, Mgr.
Feb. 18-23—Grand Rapids, Mich., Automobile Business Assn., Klingman Building. Ernest T. Conlon, Mgr.
Feb. 18-23—Newark, N. J., N. J. Auto Exhibition, Co. G, First Regiment Armory. Claude E. Holgate, Mgr.
Feb. 18-23—Des Moines, Ia., Des Moines Automobile Dealers' Assn., Coliseum. C. G. Van Vliet & Dean Schooler, Mgrs.
Feb. 18-23 — Springfield, Ohio, Springfield Auto Trades Assn., Memorial Hall. C. S. Burke, Mgr.
Feb. 18-23 — Waterbury, Conn., United Shows Co.
Feb. 18-24 — Des Moines, Ia., Ninth Annual Passenger and Second Annual Truck, Des Moines Automobile Dealers' Assn., Coliseum. C. G. Van Vliet & Dean Schooler, Mgrs.
Feb. 18-24—Des Moines, Ia., Second Annual Truck, Auditorium Dean Schooler & C. G. Van Vliet, Mgrs.
Feb. 18-25 — Pittsfield, Mass., State Guard. State Armory. James J. Callaghan, Mgr.
Feb. 20-23—Quincy, Ill., First Annual, Armory. L. B. Bartlett, Mgr.
Feb. 18-27—So. Bethlehem, Pa., Fourth Annual (cars 18-23; trucks 25-27), Coliseum. J. L. Elliott, Mgr.
Feb. 22-Mar. 9—Brooklyn, N. Y., Brooklyn Motor Vehicle Dealers' Assn., Twenty-third Regiment Armory. I. C. Kirkham, Treas.
Feb. 25-Mar. 2—Muskegon, Mich., Second Annual, Merrill Auditorium. John C. Fowler, Mgr.
Feb. 25 - Mar. 2 — Bridgeport, Conn., Fourth Regiment Conn. Home Guard, State Armory & Casino. B. B. Steiber, Mgr.
Feb. 27-Mar. 2—Columbus, O., Auto Exhibitors Co. W. L. Carney, Mgr.
Feb. 27-Mar. 6—Boston, Mass., Salon, Boston Automobile Dealers' Assn., Copley Plaza Hotel. Chester I. Campbell, Mgr.
Mar. 1 — Lyons, France, Third Sample Fair.
Mar. 2-9—Pittsburgh, Pa., Automobile Dealers' Assn. of Pittsburgh, Motor Square Garden. John J. Bell, Mgr.
Mar. 6-9—Clinton, Ia., Clinton Automobile Dealers' Assn., Coliseum.
Mar. 8-11 — Green Bay, Wis., Brown County Automobile Trade Assn.
Mar. 16-20—Great Falls, Mont., Montana Automobile Distributers' Assn.
Mar. 19-24—San Francisco, Cal., Motor Truck Dealers of San Francisco, Auditorium. Ivan R. Gates.
Mar. 19-24—Cedar Rapids, Ia., Cedar Rapids Auto Trade Assn., Auditorium.
Mar. 20-22—Houlton, Me., Second Annual, Houlton Motor Car Dealers' Assn., Bangor St. Exhibition Hall. J. D. Luth, Mgr.
Apr. 9-13—Stockton, Cal., San Joaquin Auto Trade Assn. Samuel S. Cohn, Mgr.
Sept. 23-28 — Chicago, National Accessory Show for Fords. Coliseum.

S. A. E.

Jan. 9—New York, Tenth Annual Dinner, Motor & Accessory Mnfrs. Assn., Waldorf-Astoria, 7:30 p. m.
Jan. 10—New York, Automotive Dinner at Hotel Biltmore.
Jan. 11-16—New York, Convention, National Association Automobile Accessory Jobbers, Hotel Astor.
Jan. 29-31—Chicago, Annual Convention, Garage Owners' Assn. of Ill. Green Room, Congress Hotel.
Feb. 1 — Chicago, War Dinner during Winter Meeting.

Engineering

American Society of Heating and Ventilating Engineers.
Mining and Metallurgical Society of America.

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE
THE CLASS JOURNAL COMPANY
231–241 W. 39th STREET NEW YORK CITY

CONTENTS

VOL. XXXVII. NEW YORK, December 27, 1917 No. 26

EVEN now when building activity in all lines is considerably below normal, Studebaker dealers in all parts of the country continue to erect new and larger buildings.

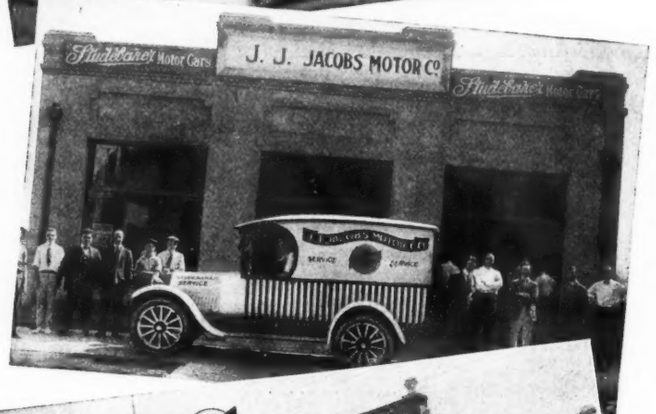
The Studebaker dealer can logically follow such a course. His success with Studebaker cars and his knowledge of the gigantic resources which safeguard his future, inspire his complete confidence.

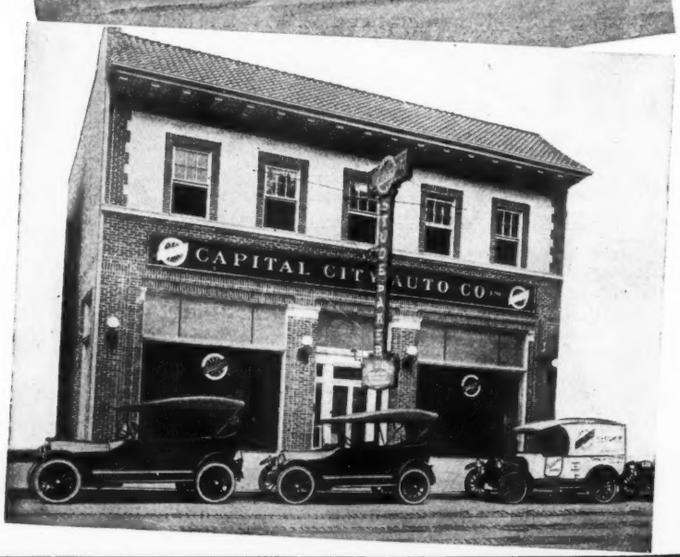
The illustrations shown on this page are typical examples of buildings recently erected by Studebaker dealers.

STUDEBAKER

South Bend, Ind.
Detroit, Mich. Walkerville, Ont.

Address all correspondence to South Bend.





Why do Gurney Bearings carry heavier loads?

GURNEY BEARINGS carry heavier loads than other ball bearings because our method of assembling permits filling the races full of balls without cutting a filling slot in the shoulder of the race.

The filling slot reduces the load capacity of the race and for this reason most manufacturers prefer to have the races only about two-thirds full of balls rather than use a filling slot. It is only in the Gurney Bearing that you can secure the full complement of balls without the filling slot.

Another reason for the high capacity of Gurney bearings is the high accuracy of the race contours, which is made possible by the use of special machinery developed by our Mr. Gurney. By making the contour of the raceway an **accurate** curve which follows closely the curvature of the ball, we greatly increase the area of contact between ball and race.

The increased area of contact makes it possible for a ball rolling in a Gurney raceway to safely carry twenty-six times as much load as the same ball could carry rolling on a flat surface.

These are the reasons for the large load capacity of Gurney Ball Bearings, and this large load capacity is the reason why Gurney Bearings are used by such Companies as General Electric, Westinghouse, Allis Chalmers, J. G. Brill, Otis Elevator, Lodge & Shipley, Pratt & Whitney, Brown & Sharpe, and many others almost as well known.

Our Service Engineering Department makes a specialty of solving difficult bearing problems. If you have any such problems our Engineers will be glad to give you the benefit of their wide experience.

Gurney Ball Bearing Co.
Conrad Patent Licensee
Jamestown, N. Y. 210

Representative Group of Gurney Bearings

Largest Bearing is 19.685 in. diameter and has a load capacity of 64,500 lb.

Smallest Bearing is 1.8504 in. diameter and has a load capacity of 500 lb.

The six largest bearings are "extra large sizes" not listed in our catalog. Only twenty-six of the fifty-seven standard sizes listed in our catalog are shown in this group.

They've Put Years on This Job

It's one thing to know that you ought to be getting better bearing service—it's another to know how to get it.

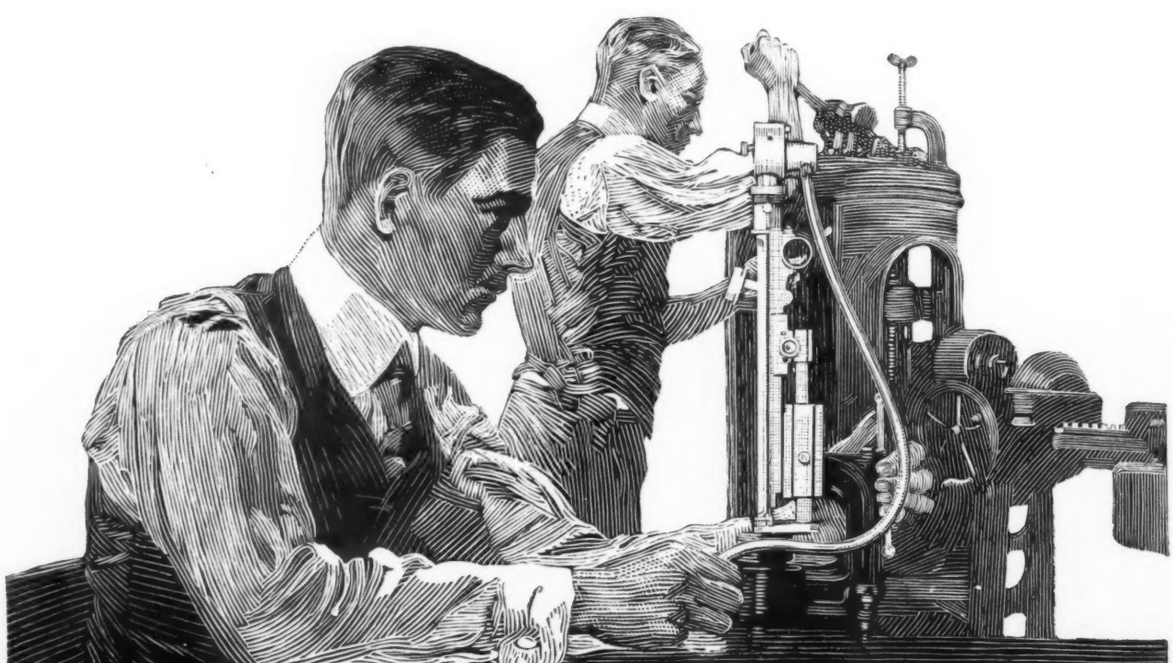
For there's a problem in determining just what physical properties bushings and bearings should have for a particular job and another in obtaining bearings that uniformly possess those properties.

Here's where *Lynux* experts can give you real help. They've spent years solving just these problems. Day in and day out, month after month, they've studied bearing metals from every angle.

Their work has made *Lynux* possible, and they make it possible for you to get just the bearing that will best do any job in your plant.

And what a difference there often is in results between using a bearing that will do the job and using the one that will do it in the one best way!

If you aren't certain that the bearing you're using on that job is the right one, let *Lynux* experts help you. If you're having bearing troubles, let



LYNUX

BRONZES

To Help Make Your Job Easier

Lynux experts help you. If you're having difficulty getting bearings up to your specifications, let *Lynux* experts help you.

Among the more than one hundred *Lynux* Alloys, there's pretty sure to be one that's right for your purpose. If there isn't, *Lynux* experts can make one.

Lynux 98 is a superior alloy for high speed and heavy-duty. *Lynux* Bronze-Back Babbitt-Lined Bearings are giving unusually satisfactory service in various applications. We are also equipped to supply all kinds of rough and finished brass and bronze castings.

Let us send you our monthly mailings on subjects of interest to bushing and bearings users. Address Dept. 49.

Where light-weight without sacrifice of strength is desired, Lynite, a group of aluminum alloys, is being widely used. Lynite is made with the same scientific care and accuracy as Lynux.

THE ALUMINUM CASTINGS COMPANY

LYNUX and LYNITE Castings

Cleveland Detroit Buffalo Manitowoc, Wis. Fairfield, Conn.

BUSHINGS BEARINGS

DILLON MULTI VISION LENS

Roads Are Getting Worse Driving More Dangerous

Sell the Dillon

Here is the lens that science built. Every angle, every curve, every detail has been designed and developed with scientific precision. Hence, the Dillon spells safety. Safety at night, at last, for driver and oncoming motorist alike.

The Dillon is the only lens on the market that successfully eliminates glare without decreasing your range of vision. It actually gives you TWICE THE LIGHTED AREA.

A Square Path of Light—SAFE

The narrow, triangular shaft of light of the average lens is dangerous and does not provide illumination for that part of the road that should be lighted. The Dillon, with its distinctive square path of light, affords illumination for over 500 feet ahead and over 25 feet on either side.

Extensive Advertising Campaign Attractive Selling Helps

The Dillon Multi-Vision Lens is now being nationally advertised in the country's most influential publications. In addition, every advertisement is made yours because of our unique trade character, Otto Deeler. We also help you by giving you many valuable selling helps FREE. Write at once.

DILLON LENS & MFG. CO.
WHEELING, W. VA.

To the Trade—Write our Distributors for Liberal Terms

Easy to Sell
Easy to Handle

$3.50 Per Pair

Any Size—Same Price Anywhere

Dealers and Jobbers:

An exceptional proposition is offered the trade, as well as valuable selling helps. Write today for full information.

NATIONAL DISTRIBUTING BUREAU, Inc.

Sole Distributors NB **for the Dillon Lens**

240 Oliver Building, Pittsburgh, Pa.

Another Great

This car will be exhibited at the New York Show — Space C-11, 3rd floor, Grand Central Palace.

This car will be exhibited at the Chicago Show—Space G24 to 49 in the Greer Building.

By World's Champion Light Six

6,202 Miles With SEALED Hood, Clutch and Transmission

CHICAGO to the Pacific Coast and back—no CHANCE to touch the engine—no chance to even LOOK at clutch or transmission—that is the latest wonderful record of the ELGIN SIX.

The Valve-in-head Motor never faltering on the steepest inclines, in the deepest mud nor the heaviest sands—

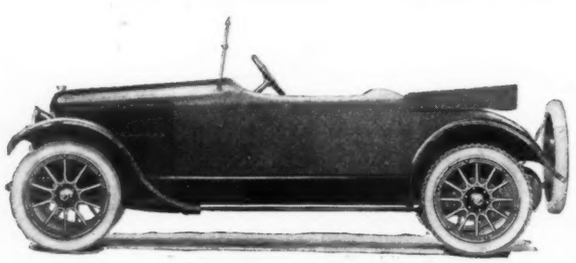
The CLUTCH holding on mile after mile of steepest mountain climbs—

The BRAKES holding fast on mile after mile of downward plunges—where slipping meant death—

What eloquent proof of the 100% *stamina* and *dependability* of this strictly stock ELGIN SIX.

And Economy—19.4 miles to the gallon of gasoline.

Elgin Six

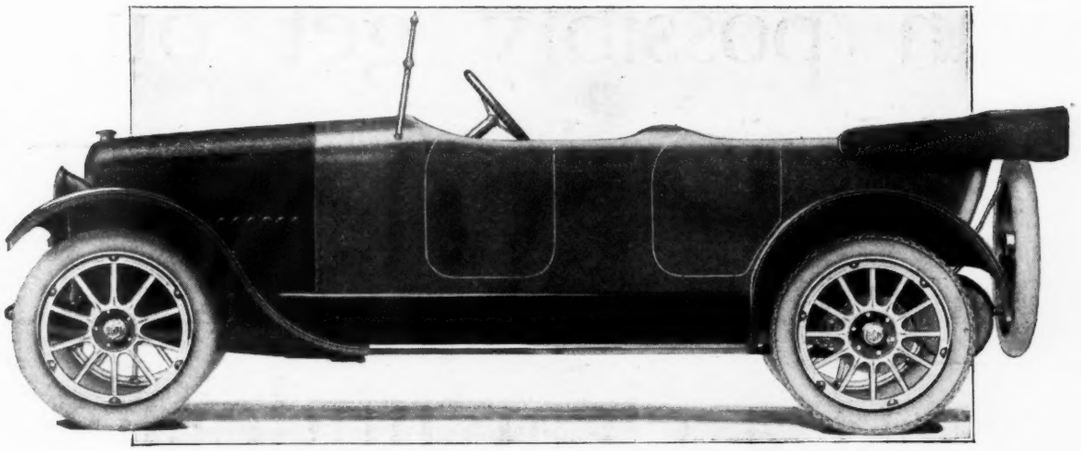


Elgin Six 4-Passenger Roadster, $1095

F. O. B. Chicago

A car for business and professional use, as well as for all-'round driving. Roomy enough for four people, yet not too large for one or two. Front seats divided. Beautiful yacht-line design. A popular, practical model. Same chassis as touring car, with 117-in. wheelbase, valve-in-head motor, etc.

Victory Scored



Elgin Six 5-Passenger Touring Car, $1095 F. O. B. Chicago

A roomy, impressive car. 117-inch wheelbase. Valve-in-head motor. Quality upholstery and finish throughout. Flexible, powerful, smooth running and easy riding. The most economical car of its size. Beautiful, durable. A family car which old and young alike enjoy.

ENGINE, clutch and transmission performed *without adjustment—without repair*—for two solid months of continuous travel under the roughest usage.

The Elgin climbed and descended the precipitous slopes of the Rocky Mountains; threading its way along tortuous, rock-strewn mountain trails; plunging through unbridged streams.

Without a break the car ran perfectly in the freezing, rarefied atmosphere above the clouds; and cooled perfectly in 132 degrees of desert heat, where heavy pulling increased the difficulty of *keeping* a motor cool.

A broken fan-belt—compelling the car to travel a thousand miles homeward *with a still fan*—a performance almost unbelievable—added a crucial test.

The record-breaking run from Chicago to Miami, Fla., the Minneapolis-Fargo dash, and many other famous ELGIN winnings had fairly earned for the ELGIN the title of "World's Champion Light Six."

Hence, when the officials of the Chicago Motor Club determined to secure authentic data on the condition of the two great national highways—The Lincoln Highway and The National Old Trails Highway—they selected the ELGIN SIX because of its previous wonderful records. It was made the "Official Scout Car," traveling under the auspices of the Chicago Motor Club, the American Automobile Association, the Detroit Automobile Club, and many other Associations affiliated in the Good Roads Movement of America.

In the Service of the U. S. War Department

But the greatest honor was conferred upon the ELGIN SIX when Secretary of War Newton D. Baker, in a personal letter, appointed it Official Scout Car to report transcontinental road conditions to the War Department—to gather information that may prove most valuable to the War Department in emergency movements of troops and supplies.

It was a commission of honor for the ELGIN. No car had ever been sent on an errand so important to this Government. No car had ever been charged with a service so distinguished.

Successful dealers are fast coming to the Elgin Six.
A highly profitable connection may be awaiting YOU.
Wire for territory and full details.

Address Dept. 19E

Elgin Motor Car Corporation, Chicago, U. S. A.

Elgin Six Sedan, $1645

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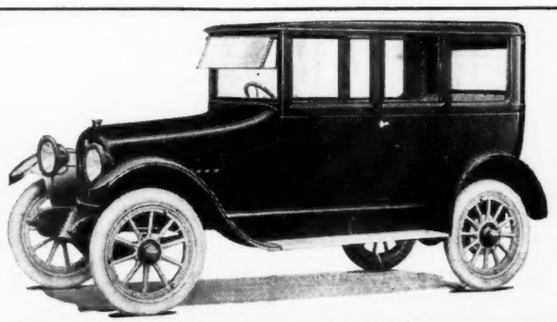
A richly finished, luxuriously upholstered car that meets the all-season, all-weather requirements. Interior of best Bedford Cord. Plate glass windows. Silk curtained rear and rear quarter windows. Patented, adjustable steering wheel. Heavy Brussels carpeting for the floor. Electric dome light for interior.



Elgin Six

Auto-Lite

Starting, Lighting & Ignition

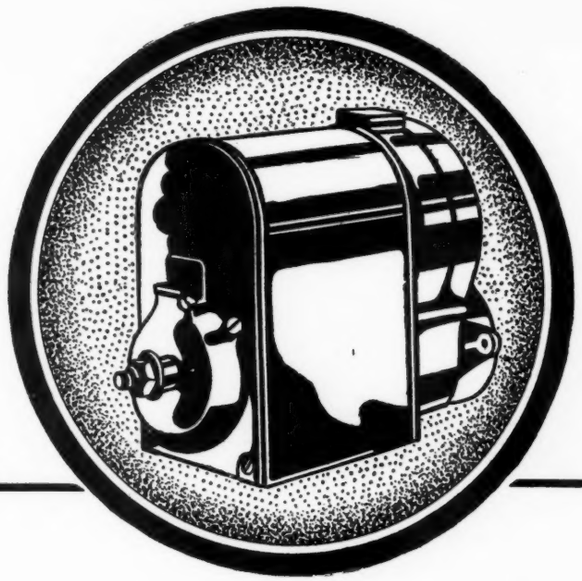
MAXIMUM care is exercised and rigid inspections enforced at every step in the process of construction of the Auto-Lite system.

The illustrations show the process of assembly of generators during which each different operation is carefully checked by inspectors and anything not up to the standard is rejected.

The high quality standard to which every Auto-Lite system must conform is responsible for its being the *largest in the world.*

And responsible for its being preferred by manufacturers of all types of cars.

Electric Auto-Lite Corp.
Head Office and Factory, Toledo, Ohio
Detroit Sales Office, 1507 Kresge Bldg.



The Difference between Magnetos

It lies primarily in the design.

Any Magneto maker can use the best of selected materials if he will. Some do.

But designs are exclusive. They account for the differences both in sturdiness and in electrical efficiency.

For example, the fewer parts in Eisemann Magnetos, and in particular the one-piece frame, contribute enormously to durability and therefore reliability.

Then, too, the direct route by which the current is picked up and distributed prevents electrical losses.

The patented pole pieces and the excellent proportions of the windings are important factors.

To the combination of all these points of superiority, may be traced the power of the Eisemann spark.

When thorough investigation and comparison is the basis for selecting the Magneto, Eisemann almost invariably earns the decision.

THE EISEMANN MAGNETO CO.

Sales and General Offices: 32-33d Street, Brooklyn, N. Y.

Chicago, Ill., 910 So. Michigan Avenue
Detroit, Mich., 802 Woodward Avenue

THE

This is Louis Chevrolet's O.K. Just As You Find It On Every AMERICAN SIX

O.K. Chevrolet

When you raise the hood of an AMERICAN SIX you find this signature, just beneath the name plate, on the inside of the dash, in Chevrolet's own hand—"O. K. Chevrolet." This is the last touch that is put upon all finished cars as they leave the American plant, and it means that such cars have been passed and approved by Louis Chevrolet, head of the engineering organization behind this truly great car.

Taken by itself perhaps this is a small detail. But when you consider it alongside the record of unfailing service which the AMERICAN SIX is building up in the hands of owners and dealers you begin to see that it is a Big Thing.

Not a broken spring, a bad axle, a weak transmission or an underpowered engine among all the hundreds of AMERICANS that have been put upon the road this season! This fact and a large and fast-growing army of satisfied purchasers indicate the real significance of those little words—"O. K. Chevrolet."

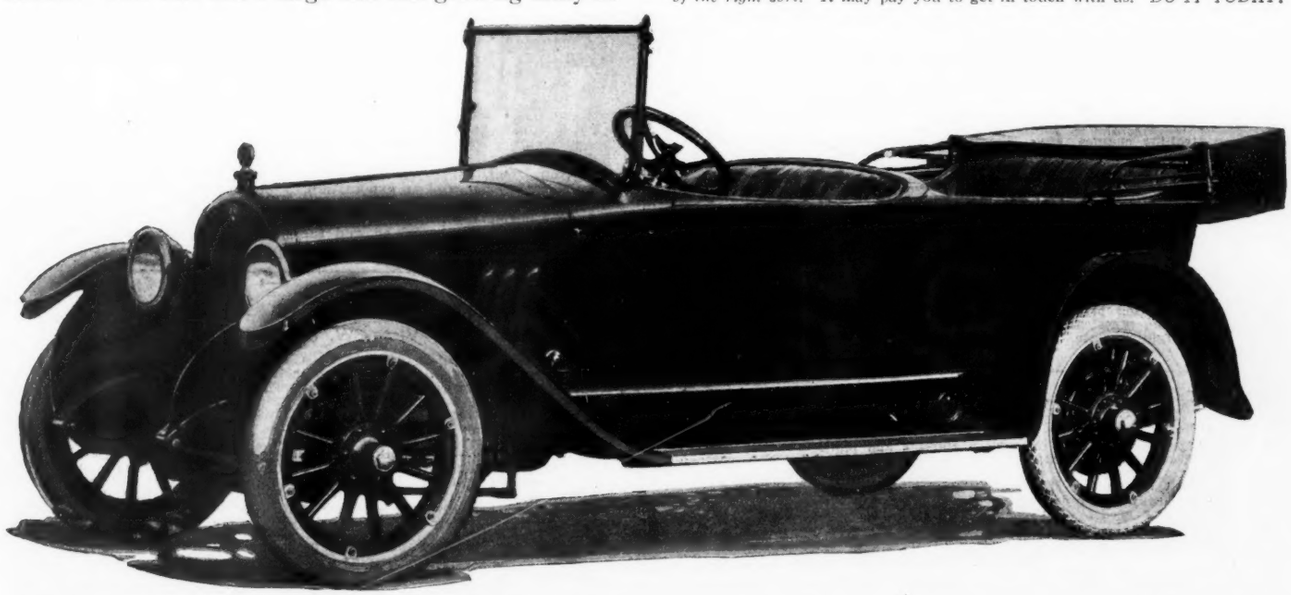
A *road-tested car*—how often do you find it in these days of "quantity production"? The output of the AMERICAN SIX is growing fast but it is not yet so big that each car cannot be built right and proven on the road before it is put in your hands.

Louis Chevrolet's O. K. is a sure guarantee of the sterling qualities that set the AMERICAN SIX apart from lesser cars.

To Dealers and Distributors

Last month was a record month in the upbuilding of the AMERICAN SIX dealer organization. Contracts were closed for more than $5,000,000 worth of cars. In most cases these contracts were closed with dealers who had to be "shown." They came on to Plainfield, N. J.—where the AMERICAN SIX is built. They looked over the modern, well-equipped American plant. They "road-tested" the AMERICAN SIX on the hills of New Jersey and in the traffic of New York. They became acquainted with the manufacturing and sales organization that stands behind the AMERICAN SIX. And every one signed up right there on the ground *for more cars than he had first counted on.*

There is room in the AMERICAN SIX organization for still more dealers *of the right sort.* It may pay you to get in touch with us. *DO IT TODAY.*



American Motors Corporation

LOUIS CHEVROLET, Vice-President and Chief Engineer

FACTORY AND SALES OFFICES: PLAINFIELD, N. J.

THE CLEARING HOUSE

OF THE MOTOR INDUSTRY

For Parts, Accessories, Tires, Machinery, Rebuilding, Repairing, Welding and Used Cars. Also Help and Situations Wanted and Miscellaneous Classified Advertising.

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In Stock To Fit

ALL BRAND NEW PARTS * NO SECOND HAND JUNK

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AT

Discount

We also do

Gear Cutting
Hardening
Broaching
Machine Work
Slotting, Grooving
Die Casting

and

Axles Made to Order at Short Notice

Bulletin No. 42

Jos. C. Gorey & Co.

Pioneer Parts Experts

9489 Columbus

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PARTS FOR ALL CARS!

AUTO PARTS CO.

4100 Olive Street, St. Louis, Mo.

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SAVE 50% ON PARTS

FOR STANDARD MAKES AND ORPHAN CARS. We have Wheels, Axles, Gears, Bearings, Cylinders, Pistons, Crankshafts, Camshafts, Crank Cases, Transmissions, Hubs, and other parts.

COMPLETE REAR AXLES—$20 to $65
PRESTO TANKS, SIZE "B"—FILLED—$8

WE HAVE PARTS FOR MOST ALL STANDARD MAKES OF CARS. WRITE US FOR YOUR NEEDS

E M F 30—Krit
Chalmers F & 36
Moon C 30 and 40
Maxwells Q,F,K,G,& AA
Garford 39 & 40
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Packard, 1906 to 1909
Reo 1910—Empire 20
Buick 10-17-19-25
Maxwell Mascot
Parry—Rambler
Cole—30-40
Stutz—Imperial
Oakland 1910 & 35
Regals 1909 to 1914
Cadillac 1909 to 1912
Mitchell 1907 to 1912
Marmon 1909
Flanders 20—Warren 30
R. C. H.
Glide—Stoddard-Dayton
Everett 30—Hudson 20
Paige 25—Velie 40
Dorris 36
Stearns & Stearns Knight

To All Owners of Maxwell-Briscoe

Maxwell 6-50
Maxwell 4-35
Flanders "Six"
Stoddard-Dayton
Everitt
Brush
Courier-Car
Columbia
Courier Clermont
Sampson "35" Motor Cars
Alden-Sampson Trucks

The Maxwell Company has transferred to the Standard Motor Parts Company the entire Service Department on all of the models above listed, and all orders for repair parts should be placed direct with the Standard Motor Parts Company, New Castle, Indiana.

Better service will be given these owners than ever before, and many reductions in repair parts prices have been effected.

Address all orders and inquiries direct to the

STANDARD MOTOR PARTS COMPANY
New Castle Indiana

A Money-Saving Opportunity

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5-Passenger Bodies, upholstered and painted new	$30.00
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30 x 3½ Tires	9.00
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Seat Covers for Ford cars, 1916	4.00
Electric Tail Lights	.60
Ford 1916 Radiators	17.00
Roadster Bodies	25.00
Pressed Steel Frames	5.00
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Klaxon Type L Horns	14.50
Tire Chains, 25 per cent off list.	
Spark Gaps	.20
4-Cylinder Motors	35.00

Send for our Bargain Sheet

AUTO AUCTION CO.

517 and 519 W. Jackson Blvd. CHICAGO, ILL.

Continental Motors

Spicer Joints, Spicer Companion Flanges, Bearings (Annular & Timken), Axles, Ignition Material, Bosch Magnetos (a few two-spark), Steering Gears.

OTHER STANDARD MATERIAL IN QUANTITIES.

Immediate delivery. Prices right.

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just off the press, is free on request. Dealers be sure to ask for our Special Discount Sheet.

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We have sole possession of all patterns, engineering records, etc., from which Krit cars were made. We alone can furnish prompt, accurate and dependable service on Krit repairs. Address all mail the same as always to the

KRIT MOTOR CAR CO.

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QUICK SERVICE

When you need it quickest, THEN we serve you best. Immense Stocks backed with our Guarantee of "Money Refunded if not Perfectly Satisfied." Buy where it is safest at a certain bargain of

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Buy Guaranteed

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From

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Save 50% to 75%

Stop buying junk that never does or never can give satisfaction. We protect you. We guarantee our parts to be right, and what's more, we further guarantee that our prices will be as low as any other house in America. We can make this guarantee because we are the largest Auto Parts House in America. We believe in small profits and big sales. Some day you will buy from us. Why not NOW?

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GEARS for all cars 50 per cent off.
Bearings, 50c. and up
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We have Motors, Transmissions, Axles, Crank Cases, Cylinders, Pistons, etc., for the following makes of cars.

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Studebaker—Garford	Abbott-Detroit
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Dorris, 1906 to '09	Buick, 10-17-19-30
Peerless, 1906 to '13	Moon 30-40-45- & C
Stoddard-Dayton	Maxwell, all models to 13
Cole, 4-5-1913; 6-1913; 30-1912; 40-1914	Packard, 1905 to 1912
	Pierce-Arrow, '07-'12
Marmon, 1909 to 1912	Hudson, 20, 33, 37, 6-54
National 4, '10 to '13	Ohio-Regal
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Any make. All these magnetos will give satisfaction. Other makes of magnetos from **50 to 75%** off manufacturers' list price.

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MICHIGAN LOZIER
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ENGINES—Reo—12, $50.00; Mitchell—10, $50.00; Buick—17, $60.00. Write Today. Don't Delay.
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THE GWILLIAM COMPANY
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DEALERS AND REPAIRMEN, get our price list, and make a profit on your repair parts.

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OVER 100 CARS—STOCKED
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Get your repairs and parts from exclusive owners of

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Gears, Bearings, Crankshafts, Cylinders, Etc.

BOSCH MAGNETOS, Carburetors, Starters & Gener., Tires. Magneto parts for all makes.

European and Foreign countries write us your needs. Quick service. Lowest prices. Everything guaranteed.

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"ALL PARTS FOR ALL CARS"

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All types high tension Magnetos. Charging and Auto Generator $10.00 each and up.

Send five 2c. stamps for catalogue.

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ALL IN EXCELLENT CONDITION

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Write today for prices
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Tires

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Parts for All Cars

New parts, consisting of Ring Gears, Pinion Gears, Transmission Gears, Shafts, Bearings, Axles; also a vast amount of Used Prest-O-Lite Tanks, Batteries and Magnetos, sacrificed to the public.

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30x3	3.75	2.00	4.75
30x3½	4.65	2.45	5.80
32x3½	5.25	2.65	6.75
31x4	6.75	2.80	6.95
32x4	7.00	2.90	7.15
33x4	7.50	3.35	7.80
34x4	7.75	3.50	8.00
34x4½	7.90	3.80	9.65
35x4½	8.50	4.00	10.15
36x4½	8.00	3.50	10.40
37x5	9.50	4.50	11.50

All other sizes in proportion.
10 per cent more for Non-Skid

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32x3½	9.45	10.40	35x4½	17.95	19.95
31x4	11.95	13.10	36x4½	18.45	20.45
32x4	12.45	13.45	37x4	18.95	20.95
33x4	12.95	14.00	35x5	19.95	22.45
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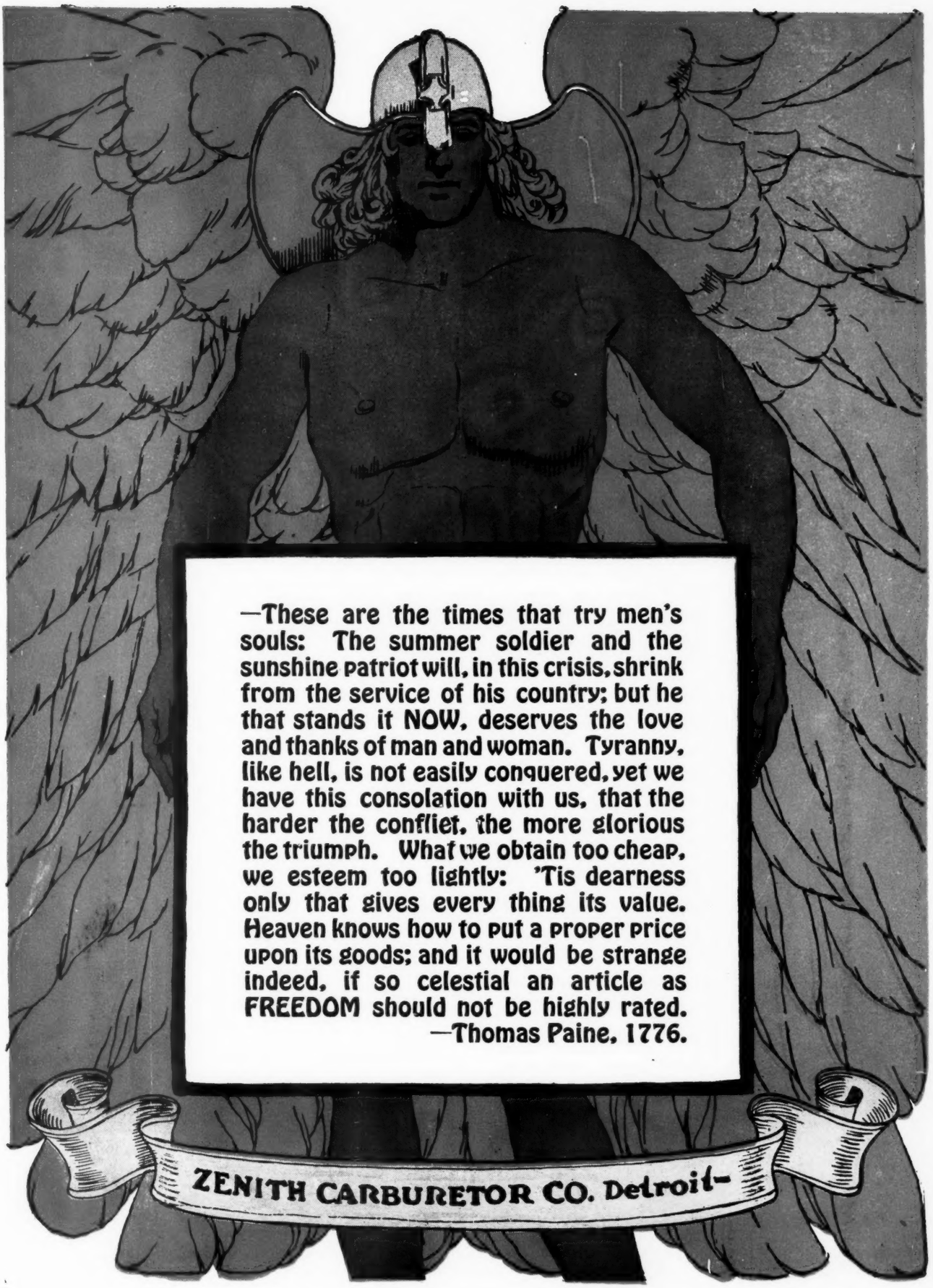
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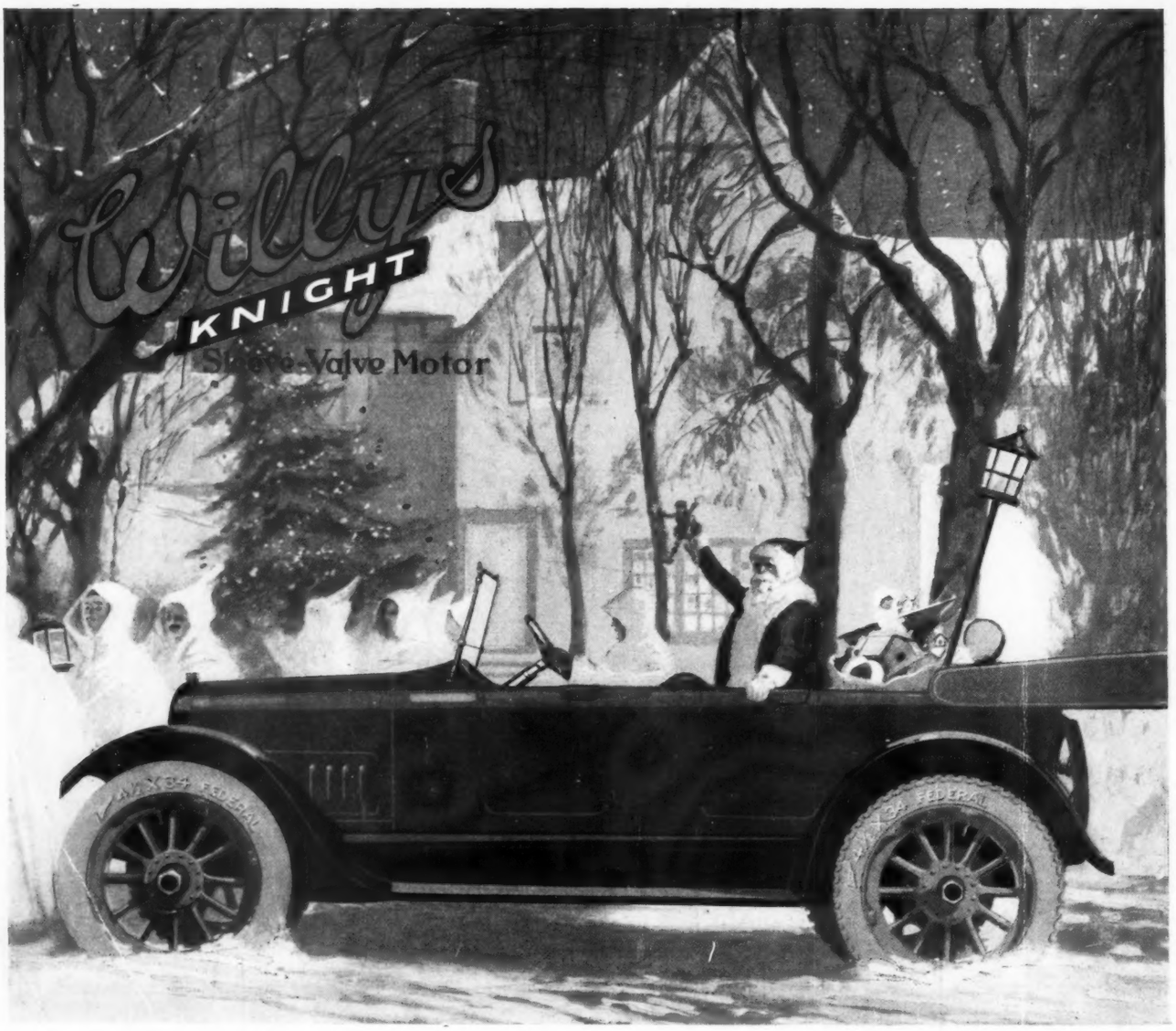

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